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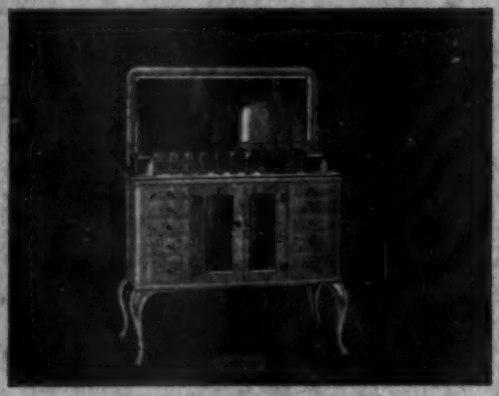

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AMERICAN JOURNAL OF OPHTHALMOLOGY

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WAR LESIONS OF THE FUNDUS.

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This paper records in outline twenty-eight cases of ocular injury, direct or indirect, with sketches showing the fundus conditions and some with diagrams to indicate the exact points at which the injuries were inflicted. These agree in the main with the observations recorded in the Lagrange Atlas. Three cases of related fundus conditions not due to trauma and one of congenital anomaly are also recorded.

The concussion following modern explosives leads to a variety of fundus lesions. This subject has been taken up by quite a number of writers, and Lagrange in 1918 published an ophthalmoscopic atlas devoted entirely to war lesions. The injuries are caused by the violence communicated thru the bones of the skull, bones of the orbit, or by air vibration "windage."* Lagrange, in his atlas, divides fundus lesions into groups and defines rules governing disorders of this kind. He says lesions by concussion are seated at the posterior pole and especially in the macula area, and secondly, that the lesions by contact are always in front of the orbital fracture or at the very spot where the missile could graze the eye; that the lesions by concussion are choroidal, that those by contact are choroidoretinal.

The "Laws" ruling the disorders of the eye in injuries of the orbit, the eyeball being preserved, are given by Lagrange as follows:—

1st Law.

The commotion of air by the explosion of a shell at a distance may injure the eye so severely that the inner membranes are lacerated. There exist well proven cases of luxation and subluxation of the lens, of traumatic cataract by this mechanism. The lesions of the inner membranes alone are analysed in our first group of cases, because they are as yet not very well known and are even subject to controversy. They consist in laceration of the uveal tract, at the posterior pole. Lagrange explains the disorders of this group by comparing the action of the air column of the ocular wall to the action of the air column on a door—or partition of a room. These lesions are located generally at the posterior pole of the eye, are sometimes very extensive and predominate in the macula area. When the eye is shaken the uveal membrane is the first to give way, so that choroidal ruptures are lesions from concussion while lesions of both choroid and retina are the result of a contact wound.

2nd Law.

When the missile passes above the orbit, injuring the frontal bone and the anterior cerebral region, it produces fractures of the orbital vault which, at the level of the foramen opticum and of the sphenoidal fissure, causes disorders in the sensory and motor nerves of the orbit; the eyeball is uninjured.

3rd Law.

When the missile travels thru the face, below the eyeball, without going thru the orbit and without fracturing it, it produces lesions by concussion involving the eye at the level of the macula region. It is the most common cause of impairment or of loss of central visual acuity. In many of these cases macular lesions are found. These are the result of the concussion transmitted to the contents of the orbit, by the pterygomaxillary fossa and fissure. They are found most frequently at the macula because

*Windage here refers to air commotion due to nearby explosion.

this region is the most delicate and most liable to injury.

4th Law.

When the missile fractures the orbit, depressing more or less its wall, and without injuring the bulb, it produces in the eyeball severe lesions by commotion (muscular and paramuscular lesions). These latter exist distinctly, whatever the location of the lesion may be, on the external, internal and inferior walls. Besides, there exist peripheral lesions always seated in front of the orbital wall which has been injured by the missile. Probably the orbital wall is at the same time fractured, raised, and thrust on the eyeball, and in this case we have to deal with a lesion by contact. But, whether the contact exists or not, we observe a remarkable fact; the peripheral lesion of the inner membranes is always situated in front of the fracture. The wave which shakes the soft tissues starts from the fractured region, and by sudden and violent shock strikes the eye situated opposite and ruptures the membranes. The choroid is injured, the blood lifts and detaches the retina. If the latter is ruptured, there arises a proliferating chorioretinitis.

5th Law.

When the missile passes thru the orbit without injury to the eyeball, it produces the same disorders, but with the addition of lesions resulting from the laceration of the organs contained in the orbital cavity. Very often, the optic nerve is cut thru, then the disc is lacerated as if it had been pulled out.

6th Law.

When the missile grazes the eyeball tangentially without rupturing it, or when the bulb is violently contused by the orbital wall thrust in, there arise immediate disorders in front of the contused spot (chorioretinal laceration with retinal detachment and proliferating retinitis); the macular region is also the seat of lesions by concussion; but the central and peripheral lesions encroach upon each other. The eye is distorted, the area of destruction goes from the posterior pole to the peripheral region situated in front of the spot in which the eye has been bruised.

During the latter part of the war, the writer had an opportunity of seeing a large number of ophthalmic cases at the "Westcliffe Canadian Ear and Eye Hospital". Our interest was first aroused by a large number of mild traumatic retinochoroiditic cases. Routine examination to find the cause of the diminution in vision revealed in many cases a diffuse cloudiness of the retina, numerous small exudates in the choroid, and fine dust like opacities in the vitreous. It was identical with the clinical picture of many cases of retinochoroiditis of secondary syphilis. The degree varied from a slight opacity of the vitreous to diffuse thick opacities with changes in the choroid. The Wassermann reaction was generally negative, and the cause of the lesion was almost invariably found to be trauma from "windage".

Our interest was soon further stimulated by the appearance of some very beautiful fundus lesions. Unfortunately it was only during the last few months of the war that it was possible to get drawings of some of them.

No. 1. *Traumatic Choroiditis. Shows three areas of choroiditis just below the macular area.* Sgt. T. Admitted to Westcliffe Hospital with gunshot wound of left eye and fracture of malar bone. Had been wounded at C. by a piece of shrapnel entering the left antrum of Highmore. He had an adherent scar at the lower border of the left lower lid. The eye and adnexa were otherwise normal in appearance. (See Plate VIII, Fig. 1)

No. 2. *Traumatic Choroiditis.* A circular white ring with a point of black pigment in the macular area about the periphery of the circle; five points of exudation are seen, also one smaller one between these and the optic disc. Vision equal to 6/36. This patient admitted to Westcliffe Hospital with gunshot wound of the left eye. He was hit with shrapnel which damaged the left eye so that it had to be removed. The right eye was normal externally but showed the fundus changes as above. (See Fig. 2)

No. 3. *Traumatic Retinochoroiditis.* The macular area shows a deep red circular area with two deep red lines above the point of exudation, whilst below and to the temporal side were seen large

areas of displaced pigment. This patient Lt. M. was admitted with shrapnel wounds of the face and left eye, non-penetrating. Right vision was normal, left vision 6/60. (See Fig. 3)

No. 4. *Traumatic Choroiditis with Extensive Rupture of the Choroid.* This patient, Pte. McG., admitted with gunshot wound of the left eye. He was hit by a piece of bone from a wounded comrade, at the outer side of the left external canthus. The piece of bone was removed, the left eye showed no external injury. In the fundus was found marked traumatic choroiditis with extensive rupture as shown. (See Plate IX, Fig. 4)

No. 5. *Macula Choroiditis and Choroidal Rupture.* Pte. G. was wounded at A. with shrapnel. He was struck just below the inner canthus of the left eye. When admitted to the hospital he had a small discharging sinus; the right vision was normal, left vision 6/60. The left fundus showed choroidal changes at the macula and a small rupture of the choroid below the disc, with a large area of choroidal rupture below. (See Fig. 5)

No. 6. *Traumatic Choroiditis.* The bullet entered two inches to the outer side of the external canthus and one-half inch above. There was seen discoloration in the macula and a large patch of choroiditis to the temporal side above. Vision equal to counting fingers at one foot. (See Fig. 6)

No. 7. *Traumatic Choroiditis.* This man was wounded at A. by a rifle bullet which struck temple one-half inch above the outer canthus. The point of exit was at the left of the auditory meatus of the opposite side. Vision 6/24. (See Plate X, Fig. 7)

No. 8. *Traumatic Choroiditis with Tucking of the Retina.* This man, Pte. K., was "blown up" at A., August 1918. The following day he noticed he could not see well. He was a sniper. He also had a severe headache. A week later his sight became poor, so that he could only distinguish hand movements. On admission right vision equal to hand movements; left vision normal. Externally the right eye was normal. Examination of the fundus showed areas of displaced pigment, especially below and to the outer side. To the temporal side of the macula there were numerous small choroidal ruptures and tucks of retinal tissue. These were also seen just at the temporal border of the disc. There was a large rupture of the choroid in the lower temporal quadrant and further below, beyond the field drawn, there was a large detachment of the retina. This drawing affords a striking example of injury to the eye by "windage". (See Fig. 8)

No. 9. *Traumatic Choroiditis.* Pte. L. This patient was hit in the left eye by a small foreign body which caused prolapse of the iris. Iridectomy was performed; right vision normal, left vision 4/60. The left fundus showed the central choroiditis as drawn, and from the angle of this area there were seen the three bands shown running to the optic disc. (See Fig. 9)

No. 10. *Changes in Macula and Choroidal Atrophy.* This patient, Pte. C., gave history, that his right sight began to fail about one month after slight injury from a bomb explosion in the Ypres Salient. Right vision 6/24. Left vision normal. The fundus showed in the macula the white crescentic area as drawn. There was also seen in the periphery a large areas of choroidal atrophy. (See Fig. 10)

No. 11. *Choroidal Rupture.* Pte. S. admitted with gunshot wound of the face. Right vision perception of light; left vision 6/9. A large rupture of the choroid below the disc with numerous large areas of displaced pigment; externally eye was normal. (See Plate XI, Fig. 11)

No. 12. *Traumatic Choroiditis with Rupture of the Choroid.* Pte. F. was wounded in the head with a fracture of the frontal bone. There was no external injury to the eye. The fundus showed a small rupture of the choroid below. Above there were numerous areas of displaced pigment, while in the macula the peculiar pepper like appearance, as drawn, was noted. The vision was 6/60. The other eye normal. (See Plate X, Fig. 12)

No. 13. *Hole in the Macula.* Pte. C. had a contusion of the left eye from a bomb explosion. There was no external injury to the eye. Right vision normal; left vision 4/60. A definite "hole in the macula" was found with an area of dis-

placed pigment above. (See Plate XI, Fig. 13)

No. 14. *Traumatic Choroiditis.* Sgt. R. This N. C. O.'s. history was interesting. His gun was hit during a bombardment at P. with tremendous "windage" on the right side of his head. He was wounded in the right foot and evacuated for that. Within a few days he came under observation, when the right vision was 6/36, left vision normal. There were dust like opacities in the right vitreous with the circular area of displaced pigment about the macular area. (See Fig. 14)

No. 15. *Peripapillary Pigmented Chorioretinitis.* Pte. H. This man had a fracture of the left temporal frontal region. Right vision normal. Left 4/60. The fundus showed the very beautiful lesion as drawn. (See Fig. 15)

No. 16. *Rupture of the Choroid.* Sapper C., admitted to the hospital with a rupture of the choroid left. This man went to France February 1916 and returned November 1917 with trench fever. In October he had received a shrapnel wound in the left eye, for which he was evacuated. Right vision normal; left vision—nil. He had a large rupture of the choroid of the left eye with resulting retinochoroiditis proliferans. It was most extraordinary that externally the eye was normal. (See Fig. 16)

Nos. 17 and 18. *Ruptures of the Choroid with Retinochoroiditis Proliferans.* These two drawings are from Pte. E. C. L., who was admitted with diagnosis of gunshot wound of the face. He was wounded at P. in October 1917. He has a scar at the outer canthus of the left. The dimness of vision in each eye is due to the rupture of the choroid with hemorrhage in the vitreous. Externally the eyes were normal. The left eye showed a large rupture of the choroid with retinochoroiditis proliferans. The right eye showed a small rupture of the choroid to the temporal and lower side of the disc. (See Plate XII, Figs. 17 and 18)

No. 19. *Traumatic Changes in Macular Area.* Pte. M. Admitted with gunshot wound, right side of the face. Right vision hand movements; left vision normal. The right fundus showed diffuse haziness of the vitreous with changes in the macular area as drawn. (See Fig. 19)

No. 20. *Extensive Traumatic Choroiditis.* Pte. J. B. Admitted with shell wound of the left eye—enucleated. This man was wounded at A., August 1918. A piece of shrapnel entered external to the inner canthus of the right eye, passed thru the nose and destroyed the left eye, which was enucleated the day following. Right vision 1/60. He had an extensive traumatic choroiditis of the right eye, surrounding the disc and extending to the nasal side. There was also a hole at the macula. (See Fig. 20)

No. 21. *Traumatic Choroiditis.* Rifleman K., wounded at C., October 18th, was admitted with gunshot wound below the left eye. The X-ray showed a foreign body lying in the orbit, behind the eye on the left side. Right vision normal; left vision perception of light. The eye was quiet and externally normal. The ophthalmoscope showed an extensive area of traumatic choroiditis as drawn. (See Plate XIII, Fig. 21)

No. 22. *Extensive Rupture of the Choroid.* Pte. C. E. R., with a machine gun bullet at the inner canthus of the left eye. The bullet lodged in the antrum. Left eye and lids externally normal. Left vision equal to poor perception of light. Examination of the fundus showed an extensive rupture of the choroid of the nasal side of the disc, extending above and below, almost as far as can be seen. To the temporal side and below there is seen displaced pigment and rupture. The intense dust like opacities of the vitreous made it difficult to get an exact fundus picture. (See Fig. 22)

No. 23. *Retinochoroiditis Proliferans.* Pte. D. S. K. was wounded near C., September 1918, by being hit on the outer side of the right orbit by a piece of shrapnel. He had a small vertical scar one-eighth inch long, one-half inch to the outer side of the outer canthus, otherwise the lids and the eye were normal in appearance. The fundus showed an extensive traumatic retinochoroiditis to the temporal side. There was a large displacement of pigment, and in a number of places the proliferating quality of the rupture was shown by its covering the vessels. This is a very pretty specimen

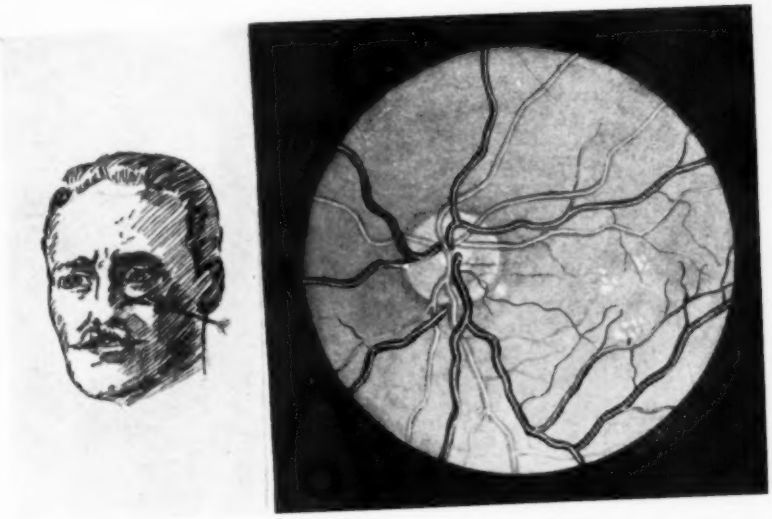


FIG. 1

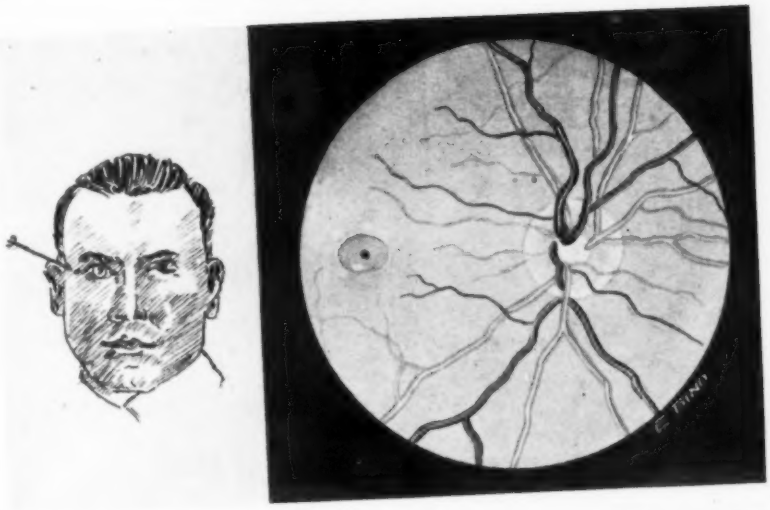


FIG. 2

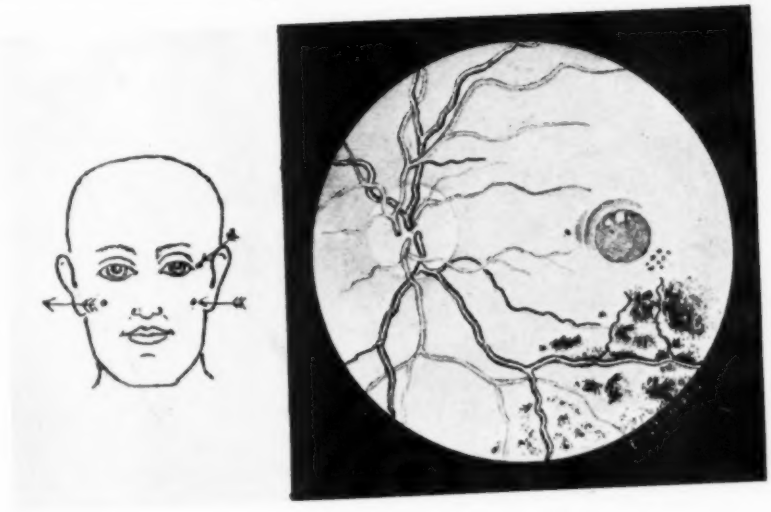
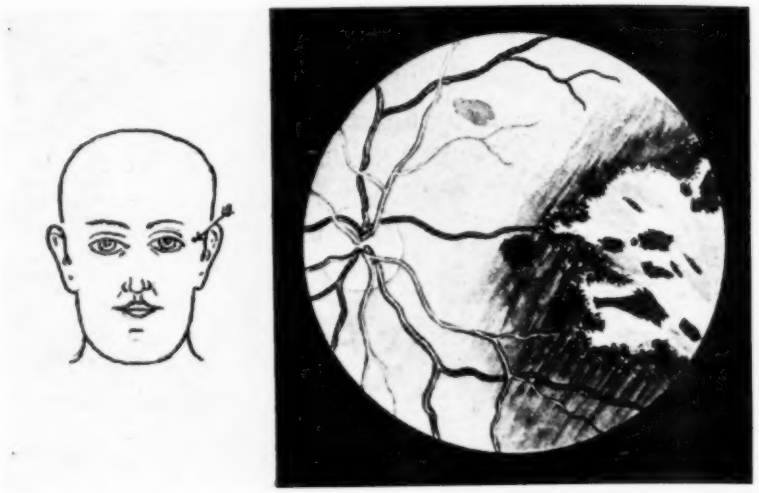


FIG. 3

WAR INJURIES OF THE FUNDUS (MCKEE)



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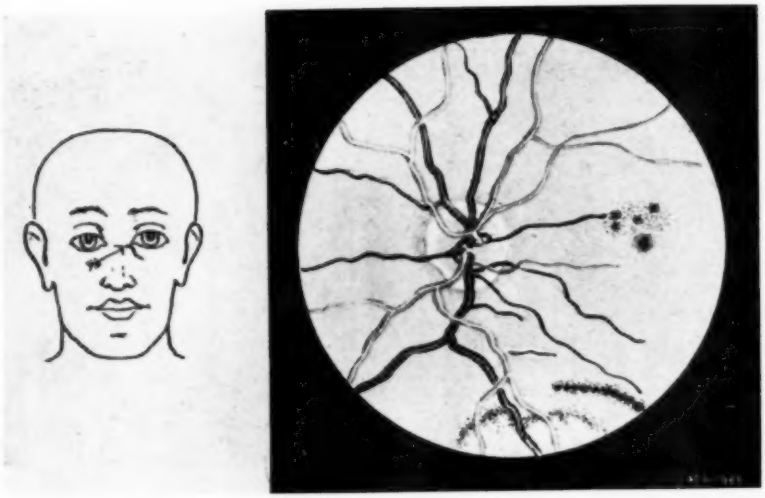

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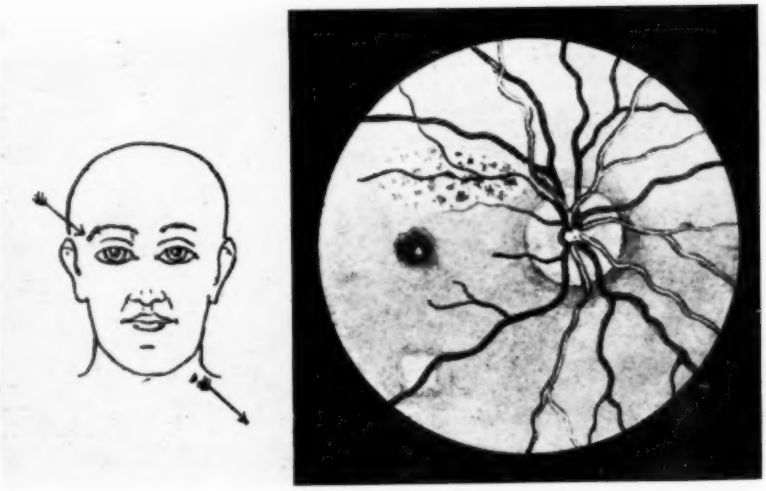

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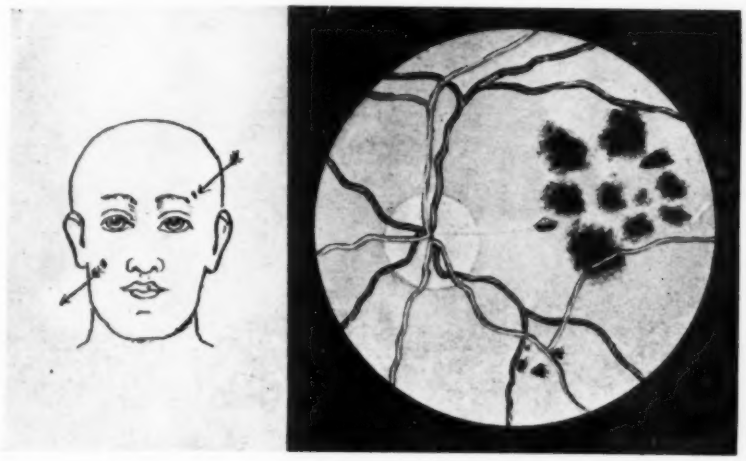

FIG. 7

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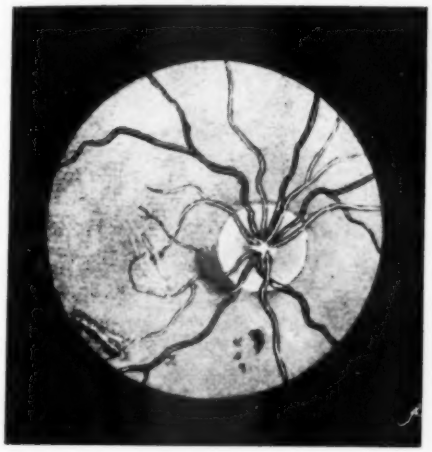

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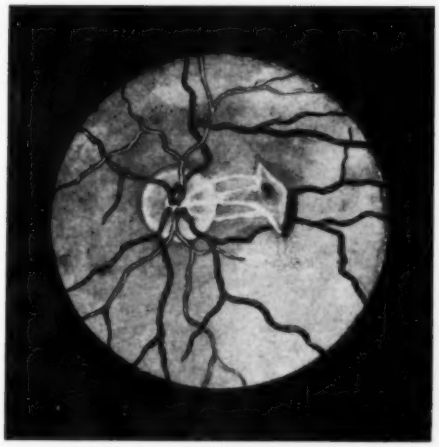

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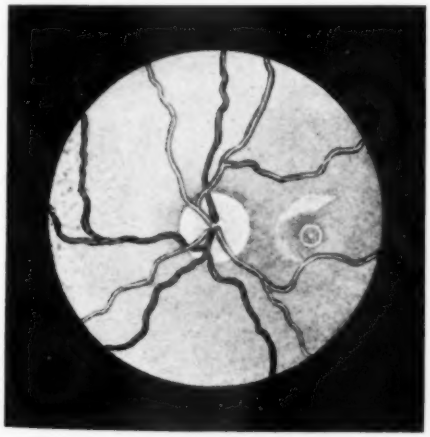

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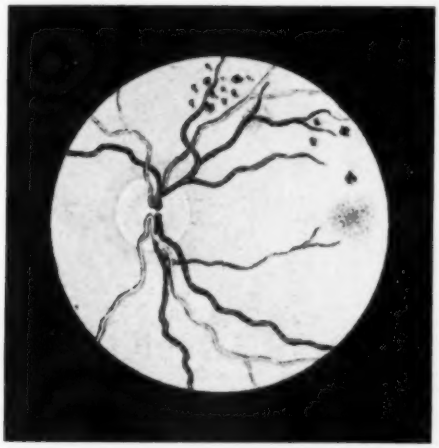

FIG. 11

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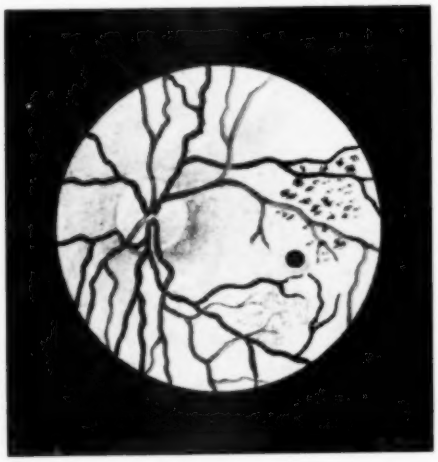

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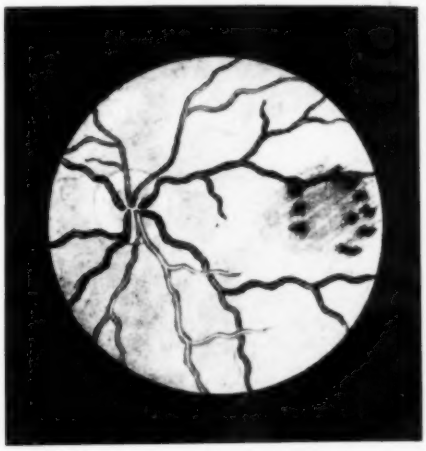

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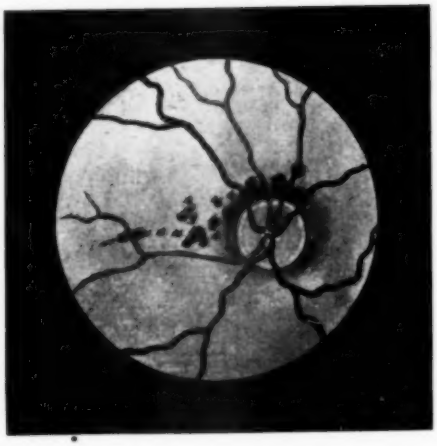

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WAR INJURIES OF THE FUNDUS (MCKEE)

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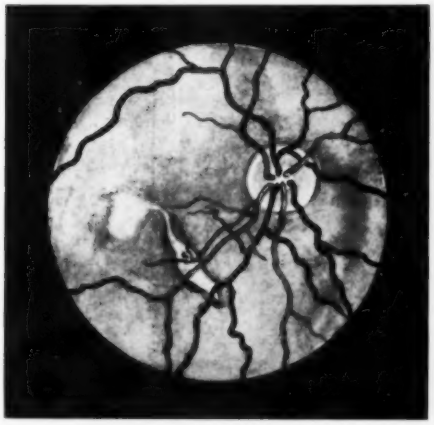

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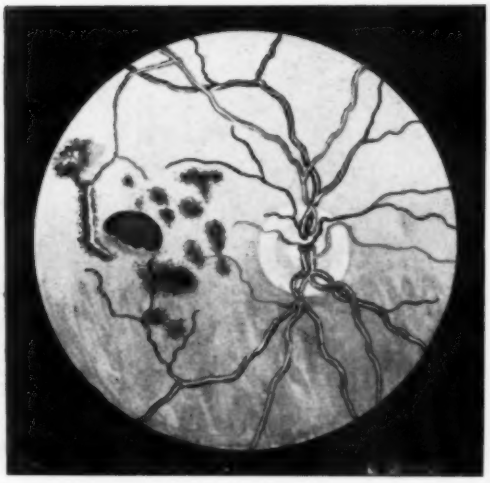

FIG. 19

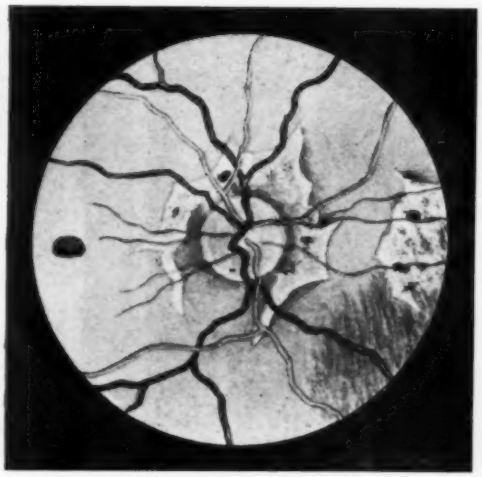

FIG. 20

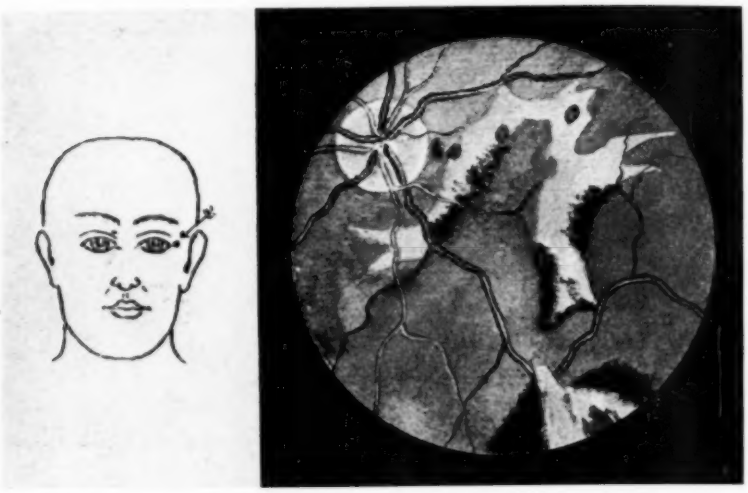

FIG. 21

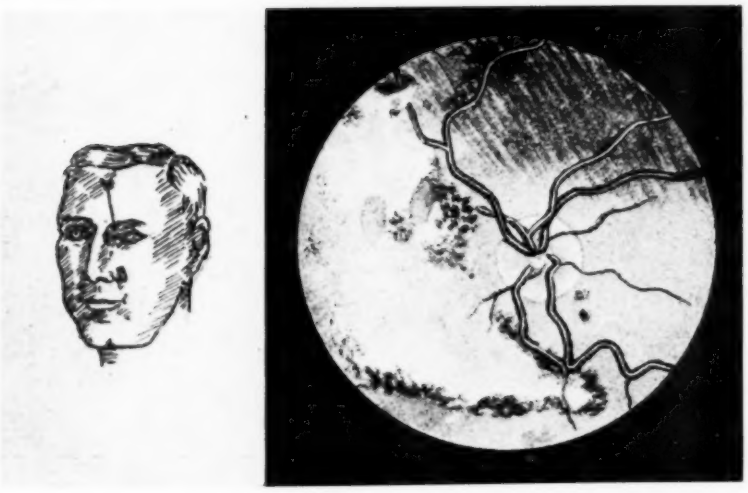

FIG. 22

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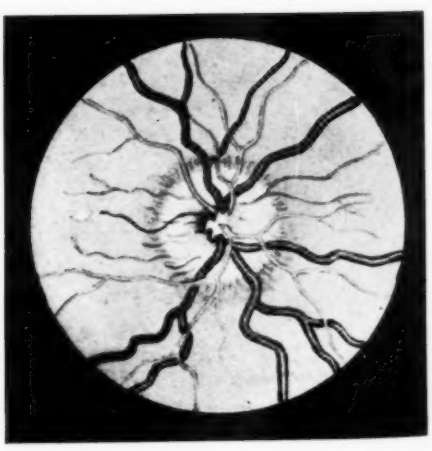

29

WAR INJURIES OF THE FUNDUS (MCKEE)

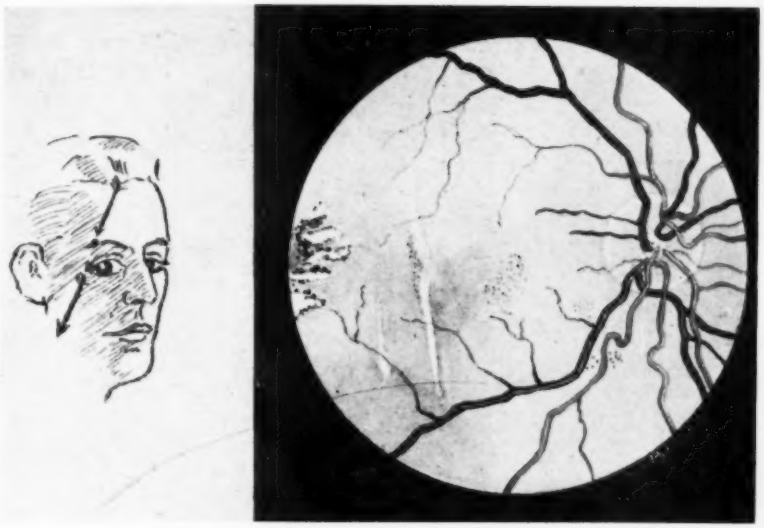

FIG. 24

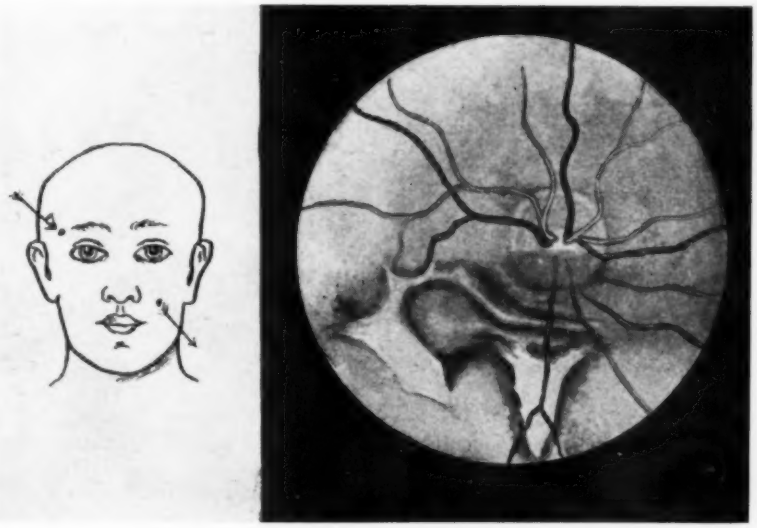

FIG. 25

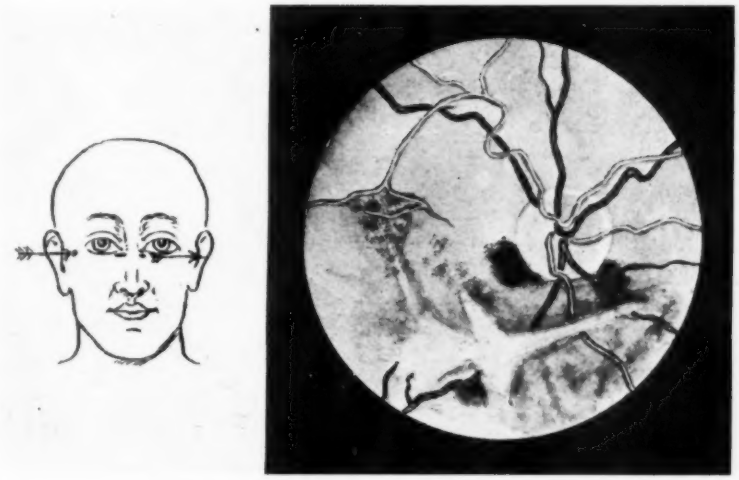

FIG. 26

WAR INJURIES OF THE FUNDUS (MCKEE)

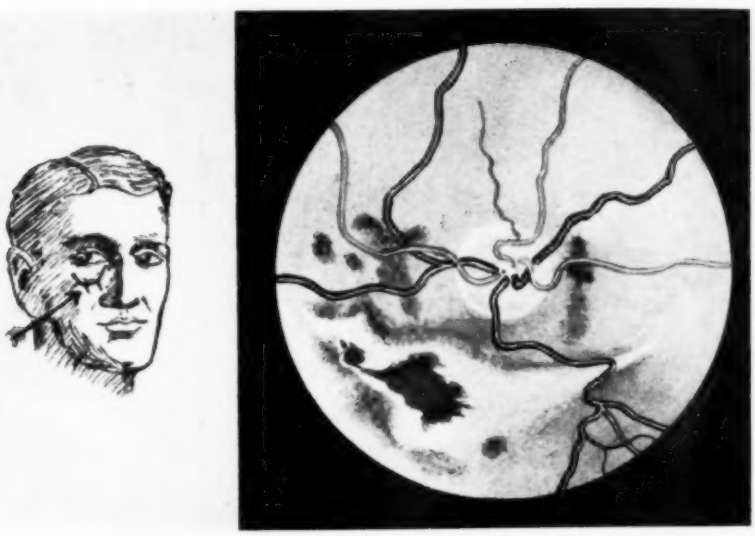

FIG. 27

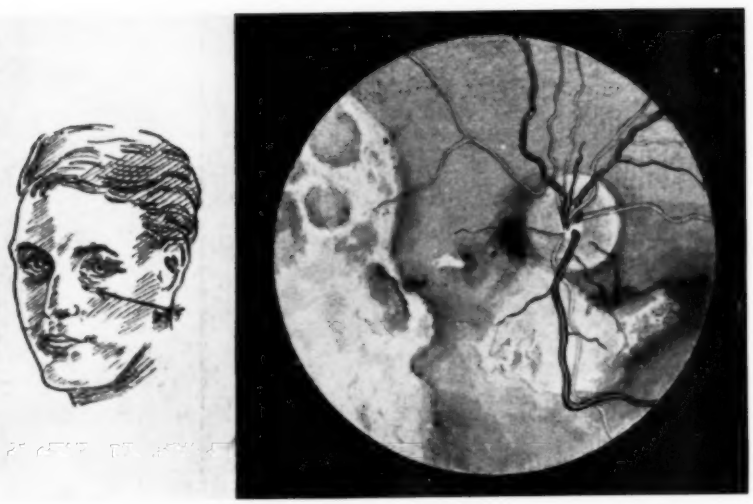

FIG. 28

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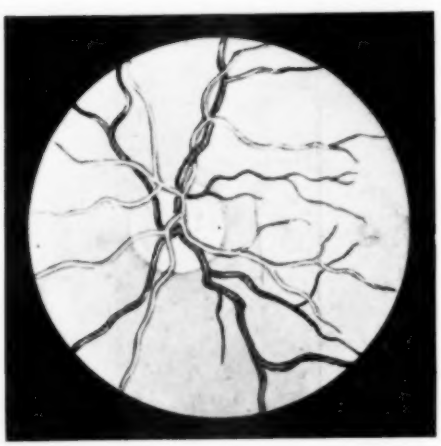

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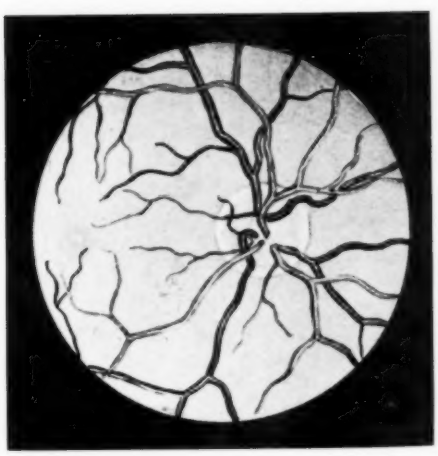

WAR INJURIES OF THE FUNDUS (MCKEE)

of the retinochoroiditis proliferans. (See Fig. 23)

No. 24. *Rupture of the Choroid.* Pte. D. was wounded January 1918 by being struck by a bullet just behind the outer canthus of the right eye. The fundus at this time showed marked concussion changes at the outer side, small rupture of the choroid thru the macula, hemorrhage at the macula and second small rupture on the temporal side. X-Ray showed numerous foreign bodies in the neighborhood of the outer wall of the orbit. Later, at the time of drawing, the right fundus showed a new superficial rupture extending completely thru the macular area from above the level of the disc to a distance below that level. There are pigment changes between the rupture and the disc, and marked choroidal changes in the periphery. (See Plate XIV, Fig. 24)

No. 25. *Retinochoroiditis Proliferans.* Pte. S. J. Wounded August 26, 1918, shell wound of the right eye, nonpenetrating. Piece of shrapnel entered 2 inches externally to the outer angle of the right eye and came out at a point midway between the tip of the nose and the lobule of the left ear. Right vision equal to perception of light; left vision normal. Fundus showed rupture of the choroid with extensive retinochoroiditis. (See Fig. 25)

No. 26. *Retinochoroiditis Proliferans.* Cpl. A. Admitted to hospital with gunshot wound of the face, nose and right eye. Bullet entered the right cheek 1/4 inch below the outer canthus of the right eye, coming out at the same level on the left side of the nose. Externally the left eye was normal. The right fundus showed an extensive rupture with marked proliferation. A beautiful example of rupture by contact, with retinochoroiditis proliferans. Left vision normal. (See Fig. 26)

No. 27. *Traumatic Retinochoroiditis.* Corp. B. was wounded by being hit below the right eye with a piece of shrapnel, severely cutting the lid about 1 inch below its margin. The eye externally was normal. Examination of the fundus showed a large area of traumatic retinochoroiditis with large hemorrhages. To the nasal side areas of displaced pigment. Note also the disc, which has the appearance of having been pulled towards the temporal side. (See Plate XV, Fig. 27)

No. 28. *Detachment of Retina and Traumatic Retinochoroiditis.* Pte. J., wounded by shrapnel, admitted to the hospital with shell wound of right eye, nonpenetrating. The lower lid had been injured causing severe sagging of the lid, otherwise the eye was normal in appearance. The vitreous was so turbid that the fundus was seen with difficulty. There was a large retinal detachment and traumatic retinochoroiditis. Left vision fingers one foot. Right vision 6/9. (See Fig. 28)

No. 29. *Intense Optic Neuritis.* This patient, L. C. B., was admitted to the hospital complaining of deficient vision left eye; headaches left side of head. The question of cerebral tumor had been raised. His vision had been poor for about two months. At the time of admission, the right vision was normal, the left vision was 6/60. The examination of the fundus showed in the left side an intense optic neuritis, for which no cause was found. Examination of the nose showed only the septum deviated to the right slightly, no pus in the nares of the postnasal space. Transillumination showed both sides normal. No anosmia or cocosmia. No indication of sphenoid sinuitis. X-Ray examination of sinuses negative. Wassermann negative. As the man had been invalided with trench fever, it was thought that this might be a manifestation of this disease. He was under observation for a long period without any apparent change in the eye condition. (See Plate XIII, Fig. 29)

No. 30. *Peculiar Bright Spots in the Macula.* This man was sent to the hospital with a marked blepharoconjunctivitis which was probably due to a high grade of hyperopia. Right vision 6/18. Left vision 6/24, with glasses normal. Examination of the fundus showed numerous fine bright shining spots about the macula area in each eye, especially between the macula and the optic disc. No cause for this condition was found. (See Plate XV, Figs. 30 and 31)

No. 31. *Choroiditis.* Dvr. R. was admitted to the hospital with left choroi-

ditis. The left sight began to fail about two months previous to observation. He was positive his vision was normal on enlistment. Right vision 6/6. Left vision fingers at two feet. Fundus showed a large area of

Fig. 32. Macular choroiditis.

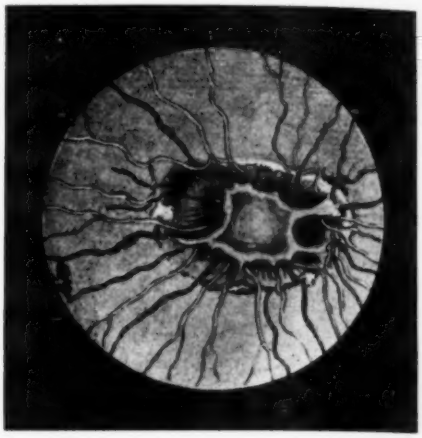

Fig. 33. Congential anomaly of optic disc.

macular choroiditis. A circular whitish yellow ring surrounding a grey center, about the edge of which were seen some pigmentary deposits. There was considerable depression in the central part of this area, and there was also some displacement of pigment between the disc and the macula area. Wassermann negative. (See Fig. 32)

No. 32. *Congenital Anomaly of the Optic Disc.* Pte. W., an Australian private, came under observation because of poor vision in one eye. He stated his vision had always been poor and that as a youngster examination of his eye has caused considerable interest in more than one clinic. The fundus showed this very extraordinary anomaly of the optic disc as drawn. (Fig. 32)

These notes were made to accompany the original drawings, made by Sgt. E. Bind of the 21st Battalion, while at the Westcliffe Canadian Eye and Ear Hospital, and form part of the Canadian National War Museum, Ottawa.

SOME USES OF THE SLIT LAMP.

SANFORD R. GIFFORD, M.D., and W. R. CASSIDY, M.D.

OMAHA, NEBRASKA.

The observations here recorded refer to the discrimination between the persistent pupillary membrane and thread like posterior synechia; pigment deposits on anterior capsule of the lens; folds in the capsule; the healing of corneal ulcer; the appearance of vessels in interstitial keratitis; certain lesions of the iris; and special appearances of the lens and vitreous humor. Reported from the Department of Ophthalmology, University of Nebraska, Medical College.

In considering the contributions made by the slit lamp to Ophthalmology, we think first of the scientific possibilities opened up by our being able to see for the first time, under microscopic magnification, structures hitherto inaccessible to us. For instance, we can study the structure of the vitreous, whose very existence is now for the first time definitely proven; we can study the lens, all of whose layers may be seen in the narrow bundle of rays as plainly as the layers of an onion. We can see the curtain of the iris roll and unroll with the muscular rhythm of the physiologic hippus.

Besides this, however, there are cer-

tain cases where the use of the slit lamp proves of real clinical value in diagnosis, prognosis, and in providing indications for treatment. After a little over a year's use of the slit lamp, we have seen a number of cases which illustrate, some the accuracy with which interesting conditions can be observed, and others the more practical advantage of the slit lamp in many common diseases.

FINE POSTERIOR SYNECHIAE.

Mrs. W. came complaining of poor vision, 20/70 in both eyes. Her fundus showed fine scattered areas of pigment displacement and atrophy, especially at the periphery, the picture very much suggesting retinitis pigmentosa. The condition was about the same in both eyes. In both eyes there were lens opacities in the posterior cortex, of the type of complicated cataract often seen in retinitis pigmentosa. The fields showed marked concentric contraction, which also fitted into this symptom complex, but she gave a history of possible specific infection, and her Wassermann had been reported postive. Slit lamp examination disclosed in one eye several fine threads from the border of the pupil to the anterior lens capsule, each thread containing fine pigment granules. (See Fig. 1)

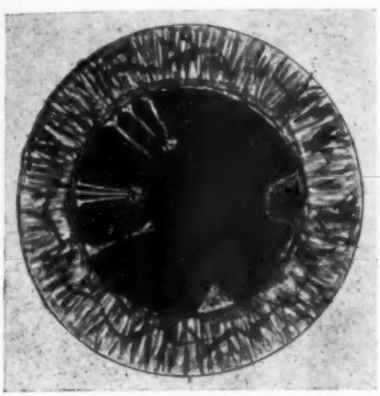

Fig. 1. Fine posterior synechiae.

The insertion of these threads in the very margin of the pupil is important as differentiating them from the congenital remains of the pupillary membrane, which insert at the lesser circle of the iris. As only the pupillary portions of such threads are visible to ophthalmoscopic examination, their real attachment can often only be seen by slit lamp. In this case we evidently had to do with old posterior synechiae, which offered certain evidence of a previous iritis, and hence was strong evidence in favor of the luetic nature of the process. The fundus picture, it was decided, was in all probability that of disseminated choroiditis due to syphilis.

The congenital remains of the pupillary membrane mentioned in differential diagnosis are very common. The threads are very fine, often being visible only by the slit lamp, and as has been said, insert not at the pupillary border, but, because of the embryologic origin of the pupillary membrane, at the lesser circle of the iris. They may easily be taken for lens opacities until the slit lamp reveals their exact situation. Bedell shows beautiful pictures of these threads.

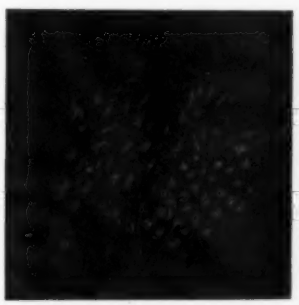

Fig. 2. Pigment flakes on anterior capsule.

PIGMENT ON ANTERIOR CAPSULE.

Another kind of congenital rest, whose true nature may easily be missed, is the presence of fine star shaped flakes of pigment on the anterior lens capsule. These are well illustrated in Bedell's article and in Vogt's Atlas. Mrs. A., 61 years of age, at routine refraction, showed on ophthalmoscopic examination, a fine layer of opacity in the anterior part of the lens. By such examination this appeared, naturally, black, like any other lens opacity, and on oblique illumination it was hardly visible. With the slit lamp, however, it was at once seen to be a

collection of very fine flakes of pigment, lanceolate and star shaped, the flakes running parallel to each other. (See Fig. 2.)

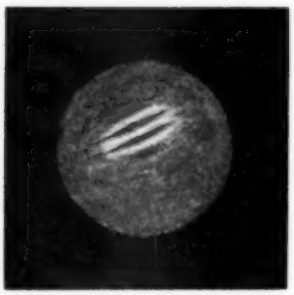

Fig. 3. Folds in lens capsule.

FOLDS IN LENS CAPSULE.

A case in which the slit lamp findings helped to determine the exact condition, tho this was of no direct value to the patient, was that of Leonard W. This 11 year old boy was hit in the eye with a clod of dirt. When seen the next day, the anterior chamber was filled with blood. After 11 days, when seen again, the blood had cleared up, and it could be seen that he had four concentric choroidal ruptures near the disc, which reduced vision to 15/200. In addition, at the level of the anterior lens capsule were four parallel dark lines crossing the pupillary area obliquely. These could not be seen by oblique illumination, only with the ophthalmoscope. Tho it was suspected that these were folds in the anterior lens capsule, due to their parallactic displacement, the slit lamp showed definitely that this was the case, the ridges and folds between them being plainly visible by the high binocular magnification thus afforded. (See Fig. 3.) The condition was unchanged when the boy was seen nine months later.

Folds in the anterior lens capsule showing a very interesting arrangement, were also seen in the case of Mrs. B., who came in one week after being hit in the eye by a flying piece of kindling wood. She complained of poor vision for near, which was accounted for by her having a complete paralysis of accommodation in that eye. She showed a most peculiar arrangement of fine lines in a series of more or less rectangular figures in the anterior part of the lens. By the slit lamp these lines were seen to be very delicate folds in the anterior lens capsule, very slightly raised from the surface. Along one of the folds were several fine pigment deposits. (See Fig. 4.) The lens was perfectly clear between the folds, and vision was 20/30. When she was next seen, days later, most of the folds had entirely disappeared, there being left one vertical fold (Fig. 5) at center, with an enlargement in its middle portion. After one month, this had almost entirely disappeared and vision was 20/25. Vogt (Atlas—Figs. 290, 291) shows folds in the anterior lens capsule, but not with the peculiar symmetric arrangement seen in our case. It is hard to imagine the anatomic or mechanical basis for this arrangement.

Fig. 4. A. Folds in lens capsule following injury B. Single fold remaining.

CILIARY PROCESSES.

An unusual opportunity to observe the ciliary processes in the living eye was provided by the case of Mrs. D., who received a severe blow with a pair of pliers a week before she was first seen. This had resulted in an

iridodialysis of the whole inner half of the iris, and in a dislocation of the lens, which was extracted. The space left

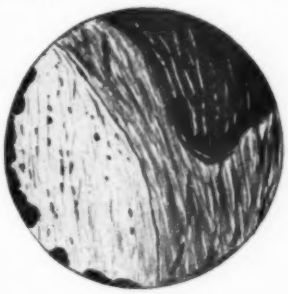

Fig. 5. Apex of ciliary process.

by the detached iris was filled with a fairly dense membrane, probably formed of fibrin adhering to the hyaloid membrane, in which were embedded numerous fine pigment granules. About eight brown pyramidal bodies could be seen plainly in the ciliary region, which were evidently the ciliary processes. (See Fig. 5.)

ULCER OF CORNEA.

In a case of dendritic ulcer, a rapid process of healing could be followed by the slit lamp. (See Figs. 6 and 7.) The second picture was made one day after the first, the ulcer having been treated simply with iodin. Healing had evidently taken place from all the borders of the fern shaped ulcer at once, leaving only a faint opacity over most of the ulcerated area, and four small areas of denser infiltration in the course of the main stem. Four isolated areas of infiltration had almost entirely disappeared.

Fig. 6. Dendritic ulcer of cornea.

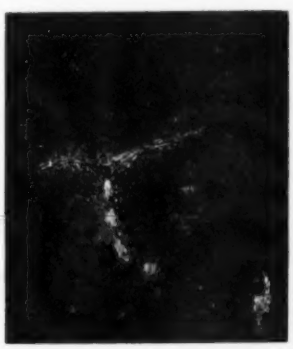

Fig. 7. The same one day later.

VESSELS OF INTERSTITIAL KERATITIS.

It has been claimed that new formed vessels are one of the earliest signs of interstitial keratitis. Three cases which we have seen in the very earliest stages, seem to afford good evidence that this is not the case. Lillian S., for example, was being treated for typical interstitial keratitis of left eye. After two months of treatment, without her having complained of any symptoms from the other eye, the faintest possible haze was seen in its cornea by oblique illumination. The slit lamp showed that this was due chiefly to an accumulation of small droplets just under the epithelium, which raised its surface in places. In the middle layers were some fine granular deposits. The corneal nerves were markedly swollen, and in the deepest layers, just over Descemet's membrane, were numerous parallel greyish striae of fairly dense appearance. No new vessels could be seen after careful search over the whole cornea.

Three days later, the deep greyish striae of infiltration were denser, and the droplets under the epithelium could still be observed. (See Fig. 8.) Next a few fine vessels could be seen just branching out from the vascular loops at the limbus, but only extending a few millimeters into the cornea. The area of infiltration remained confined to a crescent involving the outer and upper part of the cornea, and never extended into the central area. There was never more than a very slight congestion, and the new vessels observed never extended into the infiltrated

portion. After three weeks, the opacity was becoming thinner, and when last seen vision was about normal.

One other case, in which involvement of the second eye was seen at its very outset, showing the same edema of the anterior layers and linear infiltration of the deeper layers, ran a course very similar to the above case, never developing any new vessels.

A third case was seen when the process was just beginning in the first eye. In it the edema of the anterior layers was the principal feature. Atropin and energetic antispecific treatment were started at once, as there

Fig. 8. Early interstitial keratitis, showing droplets under corneal epithelium, near limbus.

were other signs of hereditary lues, and a 4+ Wassermann. There was never any congestion, and it was only several weeks later, when the infiltration was considerably denser, that there could be seen a few new vessels extending a little distance from the limbus.

This early infiltration, with vessels only coming in later, is, in fact, what we would expect from our knowledge of general pathology, as it would seem hard to conceive of an irritant which could attract vessels into the cornea, without first giving rise to some other signs of irritation which would be visible in that transparent medium. The new formed vessels would seem to be merely a secondary result of the primary inflammation; due, as Igersheimer has shown, to the actual presence of spirochetes in the cornea. They may be late in appearing, or may, in mild cases, hardly appear at all.

IRIS LESIONS.

An interesting case, clinically, was that of Frank P—, who came in with a marked congestion of the conjunctiva of both eyes. The whole conjunctiva was involved, and the note was made at first, "Probably pneumococcus conjunctivitis," tho there was little secretion. As there was so much congestion of the bulbar conjunctiva, his iris was examined carefully, but, by the usual methods, no change could be made out. With the slit lamp a peculiar hyperemia could be made out in the fine vessels of the iris, vessels of almost capillary size being plainly visible. The condition resembled greatly a picture in Krückmann's work, illustrating hyperemia of the iris coming on with the secondary eruption in syphilis.

On the basis of this evidence alone, he was given atropin and salicylat at once. The pupils dilated, revealing delicate synechiae, and he went on with the course of an acute iritis. He gave a history of a primary sore some time before, but his Wassermann was negative, and as his tonsils were badly infected, it was never certain which was the primary cause of the iritis. We have looked for this sign in other cases where there was the same question of differential diagnosis, but have not found it in such cases. In the case of interstitial keratitis above mentioned, the same delicate hyperemia was present very early.

An opportunity to contrast the appearances in Dr. Fairchild's case of tubercles of the iris with those of a syphiloma was afforded by Mrs. S—, who came in with a severe inflammation of the right iris. An area of brick colored discoloration was present near the inner iris border. The slit lamp showed that the surface of the iris was here mottled with fine hemorrhages, and was raised by a round nodule apparently on the posterior surface of the iris, which gave a faint yellowish color thru the iris. The Wassermann was positive, and under specific treatment the nodule fairly melted away, leaving an atrophic area. It was evidently a typical papule of the iris.

CHANGES IN LENS AND VITREOUS.

The degree of exactness with which depth in the eye may be judged is one of the great advantages of the slit lamp. With Vogt's method of using the smallest possible bundle of light,

the anterior and posterior surfaces of the cornea and lens may be located exactly by their respective reflecting zones, and any opacities oriented by their relation to these zones. Mr. G—, following a blow on the right eye, which had long been practically useless from some previous affection, developed congestion and pain in the eye. A yellowish mass could be seen at a considerable distance back of the iris, with a fairly sharp upper border visible. This was thought at first to be exudate from a previous infection of the vitreous. It could be seen by the slit lamp, however, that the space between the cornea and the yellowish mass was optically empty, there being no reflecting zone anterior to the surface of the mass. Thus the lens was evidently absent from its normal position, and the mass represented a dislocated lens, probably covered by old exudate which held it in place, and likewise held the iris rigid, so that the usual diagnostic sign of a dislocated lens, a tremulous iris, was absent.

After cataract operations, observation with the slit lamp is usually interesting. The vitreous, being now quite close to the iris, may be observed beautifully, and filaments of it may be seen floating in the anterior chamber. The structure of the secondary membrane may be studied, and often with practical profit. If a discission is to be done, the direction of the strongest fibers gives an indication from which angle the opening had best be made. In some cases vision is only fairly good, and details of the fundus are slightly dim. It is important to know if this dimness is due to vitreous opacities, or to a delicate membrane which could be opened by a discission. In a recent case, no fibers could be seen in the opening with the ophthalmoscope, nor any definite vitreous opacities, and yet the fundus details were not sharp. In the bright illumination of the slit lamp a very delicate membrane, without distinguishable fibers, could be seen only by the reflection from its shiny surface. This was interpreted as being what has been called adventitious hyaloid membrane, and a discission was done, resulting in a clear opening, and considerable improvement in vision.

In many other cases of such various kinds as those mentioned, the slit lamp has given information of much interest and real value. We believe that its greatest value, however, is in the diagnosis and prognosis of opacities within the lens. This subject, with the enormous amount of data which Vogt and his coworkers have collected, which has been confirmed and reported upon by Von der Heydt and others in this country, really forms a large chapter by itself, and only a few points will be touched upon here. By his observations upon a large number of lenses for about five years, Vogt has accumulated data which make necessary an entirely new classification of cataracts.

There are at least six different forms under which progressive senile cataract may first present itself, and with these and other types of lens opacities, there are from 15 to 20 types of cataracts which are fairly common. Each type of opacity is seen only in a particular portion of the lens, and from a knowledge of the exact type and location of an opacity, its future history can, in large measure, be predicted. Thus coronary, or wreath shaped cataract, whose round or oval opacities affect only the peripheral cortex, is seen in a large number of adolescents, and according to Vogt, is never progressive, and never interferes with vision. The opacities are permanent, and when seen in middle aged patients by the ophthalmoscope, may easily be mistaken for early senile cataract. In the case of a Jewish patient, 35 years of age, seen recently, we were glad that a recognition of the true nature of these opacities prevented the alarm which a diagnosis of progressive cataract would have caused. Anterior embryonal suture cataract, a roughly Y-shaped opacity at the site of the embryonal suture, is fairly common, and likewise is always stationary. We have seen one case, a woman of 40, whose lens opacities, almost symmetric in each eye, we believe to be of this nature. The Y in her case was not perfect in either eye, and she is being observed occasionally, but it was felt that a fairly certain good prognosis was justified, and that no treatment was indicated.

Our short experience with the relatively small number of eyes examined has been enough to prove to us that Vogt's differentiation of lens opacities is neither fanciful nor too elaborate; for we have already seen most of the common types of opacity which he mentions, located in their specific lens strata. Wedge shaped peripheral posterior cortical opacities, water fissures, lamellar separation, and saucer shaped posterior opacity are fairly often seen, all of these being phenomena of progressive senile cataract.

The latter form, saucer shaped posterior cortical opacity is important, as it occurs in sclerosed lenses, in which most of the cortex remains quite clear, while vision may be cut down to hand movements by the denseness of the opacity. In cases of this type upon which Vogt has operated, he found the sclerotic nucleus to make up the greater part of the lens, and to leave behind practically no cortex after ordinary expression with capsulotomy, so he claims that preliminary discission is not necessary in similar cases. A case just operated upon by Dr. Harold Gifford showed the typical picture of this condition, with only a thin shell of very dense opacity in front of the posterior capsule. At operation, the nucleus was not surprisingly large, but almost no cortex was left behind after its expression.

Dorland Smith has recently classified cataracts in a very practical way, according to the appearances they present by the ordinary methods of observation, the classification being a basis for the type of operation to be undertaken in any given case. His observation that the sclerotic lens is especially suited to ordinary expression with capsulotomy on account of its large nucleus and delicate capsule, is in line with what has been said above. Such a classification as he demands for those who have several types of cataract operations at their command, is most easily and accurately made with the aid of the slit lamp. It will be easily understood from the accuracy with which depth may be determined by the slit lamp, that the degree of maturity or hypermaturity of a cataract may usually be judged most accurately by its use.

What Vogt calls lamellar separation is a peculiar shirred appearance of the anterior and posterior cortex; due to fine fissures between the lens fibers. These are too fine to be seen with the ophthalmoscope, but slit lamp observation has shown them to be present in about 20% of persons over the age of 50. The phenomenon, while it has no effect on vision, is to be considered as the precursor of progressive senile cataract, the very incipience of incipient cataract. By observing it, we can predict development of cataract at no very distant date, and if we believe in the efficacy of any form of treatment in incipient cataract, such as cyanid injections, we might logically advise it in cases seen at this stage of lamellar separation.

The time has been too short to determine whether or not all of Vogt's dicta as to the progresive or stationary character of the various types of cataract will stand. New types will undoubtedly be described, and the significance of some types already described may prove to vary considerably from that expressed in the views of the first observers. We have already seen many cases with types of lens opacity which do not agree with any of the well recognized types, as we have been able to know them; and would consider of great value any data which would enable us to classify them definitely as progressive or stationary.

A doctor, aged 40, for example, has some peculiar flaky opacities in his central posterior cortex, which have been diagnosed by good men as the first signs of senile cataract. In appearance they much resemble coronary cataract, and they have shown no definite signs of progress during our observation, but they are peculiar in occupying the central area, and we are unable to calm his serious fears by telling him certainly that the condition is stationary. Time, however, the observation of this and similar cases, and the reports that are becoming more frequent in the literature, will undoubtedly establish facts about cases of this and other types which will make our judgments much easier to form, and much more reliable when formed.

OCULAR DISEASE FROM NASAL ACCESSORY SINUS INVOLVEMENT.

JAMES ALBERT MORGAN, M.D.

HONOLULU, T. H.

Ways in which sinus disease may affect the eye are here considered. Impaired vision with haziness of the disc was followed by great improvement after opening the ethmoid and removal of tonsils in the one case and opening the maxillary sinus in another. In the third patient convergent strabismus disappeared after draining the maxillary sinus. In the fourth case vitreous opacities and retrobulbar neuritis of the right eye were cleared up by opening and drainage of sinuses on both sides.

The anatomic relationship of the optic nerve, the nerves supplying the extraocular muscles and the nasal accessory sinuses is such that the former may readily become affected by disease of these sinuses. The elevator, superior oblique, and superior rectus muscles lie close to the floor of the frontal sinus. The internal rectus muscle is in close proximity to the ethmoid wall. The inferior oblique and inferior rectus muscles are in close relationship to the roof of the maxillary sinuses. Therefore disease of any of these sinuses may cause paralysis of any of the extraocular muscles, directly or by pressure or toxic influence on their nerve supply. Optic neuritis and hyalitis are not an infrequent consequence of ethmoid and sphenoid disease. Also many ocular conditions heretofore attributed to gonorrhea, syphilis and rheumatism may be due to the extension of disease from the sinuses via the venous and lymphatic systems.

In experiments to establish relationships between the nasal mucous membrane and the eye, microorganisms were placed on the nasal mucous membranes, with and without the obliteration of the nasolacrimal canal. The result of the experiments showed penetration of the microbes into the vitreous and aqueous humors of the eye of the same side. (Bono and Frisco). None of the animals showed any signs of general infection. One or two colonies at most could be derived from the blood in the heart, the liver, the spleen, and the lymphatic ganglia of the neck, and occasionally from the anterior auricular, the submaxillary, the deep jugular and the carotid lymphatic ganglia.

This fact considered in connection with the presence of a large number of germs in the vitreous and aqueous humors, and the absence of a general infection warrants the conclusion that the bacteria penetrated directly into the eye from the nasal and conjunctival mucous membranes, and that they also arrived secondarily in the eye thru the blood, but reduced in numbers and virulence. Part of the germs were retained by the ganglia connected with the anterior lymphatic vessels of the eyeball and its appendages.

In further experiments with instillations of India ink, it was possible to trace the exact route followed by particles from the conjunctival lymphatics along Schlemm's canal into the anterior chamber and thence into the vitreous. From the lymphatics of the nasal mucosa the particles passed into the ethmoid cells and lamina papyracea, thence into Tenon's capsule, and on into the eyeball. The practical results of these researches are particularly important in the pathology of the eye.

F. Mendel, after observing many cases, comes to the conclusion that the nasal infection and inflammation is transferred to the eye by direct connection, or continuance of the epithelium of the nasal mucosa to the conjunctiva, as well as by the intimate vascular association. The ophthalmic artery gives off the anterior ethmoidal branch, which supplies the nose and the lacrimal canal. The venous supply of the nasal mucosa, by means of the lacrimal plexus is in direct communication with the ophthalmic vein.

Hooper advances the theory that faulty pressure within the nose can cause asthenopia, thru both the ciliary and external ocular muscles. The pressure is confined chiefly to the middle

turbinal. He concludes that a moderate amount of pressure, or mechanical irritation, of the middle turbinal against the septum, will temporarily impair the function of the ciliary muscle and the external ocular muscles. If mechanical irritation can impair the function of these muscles, how much more would the continuous pressure of a septal spur, or other deviation of the septum digging into the middle turbinal, keep up this impairment.

The following cases are presented to illustrate pathologic processes in the nose and throat causing eye symptoms.

Case 1. Miss G. White. American. Age 26. School teacher. Family history negative. Patient came to the writer with a history of an acute coryza which she thought was an ordinary cold. This continued for five days, when a marked swelling about her left eye and diminution of vision in the same eye became apparent. Eye examination at this time showed O. S. 15/200. There was no increase in tension. Ophthalmoscopic examination gave no further information, except for a slight haziness of the left nervehead and macular region. O. D. Vision 20/20, eyeground normal. Form and color fields, normal. The fields of the left eye could not be taken satisfactorily, owing to the poor vision.

Nasal examination showed swelling and redness about the left middle turbinal region, and a small amount of seropus. The maxillary sinuses were clear. The tonsil crypts showed a small amount of caseous material. The left anterior ethmoid cells revealed considerable pus upon being opened, and following the operation the orbital swelling promptly subsided.

During the subsequent three weeks, the vision of the left eye improved to 20/40, and the visual fields were taken again, a large central scotoma being found. After the lapse of one year the scotoma still remains, but only one-third the original size, the patient being only conscious of a slight blur. During the period of six months subsequent to the nasal operation, there were several slight recurrences of the orbital inflammation, with no apparent effect on the vision. The attacks recurred with each cold and sore throat. About this time the tonsils were removed and there has been no further recurrence of the condition in the left eye. Corrected vision left eye is 20/30.

Case 2. Mr. S. Portuguese. Age 40. Laborer. Family history negative. Four months before consulting the writer, the patient had the left incisor tooth extracted, on account of a large cavity and abscess formation. Following the extraction there has been a continual discharge of pus from a sinus leading into the maxillary antrum. At the same time the patient noticed a diminution of vision in the left eye. Vision at this time was 15/200. The only eyeground changes to be seen were a slight haziness of the disc and retina about the macular region and overfilling of the retinal vessels. The left maxillary sinus was filled with pus, and the mucous membrane lining the cavity studded with large and small polyps, upon being opened by the Caldwell-Luc technic. The patient made an uneventful recovery from the operation. Following the sinus operation, the vision improved rapidly and when last tested, some four months later it was 20/30 without correction. Before the operation there was a large central scotoma, and after the lapse of one year the scotoma had diminished to less than one-half its original size.

Case 3. Mrs. J. Age 49. White American. Housewife. Family history is negative. Patient has been of an extremely nervous disposition and is frequently troubled with insomnia. Six months ago, following an acute coryza, there was a swelling of the left upper eyelid; and the same eye turned in toward the nose and was in a fixed position. At this time intranasal astringent sprays were used; and after the discharge of a small amount of mucopus, the swelling of the eyelid and the internal strabismus disappeared, without any apparent effect on the vision. During this time she was under the care of her family physician, from whom I procured this history.

The day before seeing the writer, the patient awoke one morning with a severe pain in the right eye, and found

that this eye turned in toward the nose, in the same manner that the left eye had done six months before. Examination revealed only 10/200 in the affected eye, and about 50 degrees of internal strabismus. The defective vision, however, was found to be mostly due to about eight diopters of myopia. The left eye showed a small amount of hypermetropic astigmatism. X-ray at this time showed a markedly cloudy right maxillary sinus, with no other intranasal involvement. The affected sinus was drained thru the inferior nasal meatus, with the escape of a large amount of pus. During the subsequent three weeks the sinus condition cleared up without the necessity of any radical measures. Forty-eight hours after draining the maxillary sinus, the muscle involvement of the right eye disappeared and did not return.

CASE 4. Mr. B. Japanese. Laborer. Family history negative. For over a year there has been a profuse, purulent nasal discharge and crusting in the throat. Two months ago the patient noticed a diminution of vision in the right eye and at the same time periods of severe headache and drowsiness. X-ray showed a clouding of the right frontal sinus, of the ethmoid cells of both sides and both maxillary sinuses. Nasal examination showed both middle turbinates studded with polyps, which were dripping with pus.

Eye examination. Right eye, vision fingers at five feet. Tension normal. The vitreous was filled with a dust like cloudiness which gave a very poor view of the fundus. Pupillary reaction was sluggish. Left eye, vision 20/20. Media clear. No fundus changes, present.

Both maxillary sinuses were drained of a large amount of pus and shreds. The ethmoid cells of both sides were exenterated and the right frontal sinus drained intranasally. Both the frontal sinus and the ethmoid cells showed considerable pus and necrotic tissue. The patient made an uneventful recovery from the operation. Shortly after the nasal operation the vitreous cleared sufficiently to obtain a clear view of the fundus, and no changes were found. At this time the color and form fields were taken and a large central scotoma found. The patient was seen again, seven months after the operation, and the vitreous was practically clear, and the scotoma had just about disappeared.

The cases presented illustrate, in a measure, the diversity in character of ocular diseases that may be caused by toxic absorption from the intranasal spaces. At the same time it is a source of constant amazement to the investigator, to find so many patients with extensive nasal disease, with marked necrosis and no ocular symptoms.

CASE 1. Presented a retrobulbar optic neuritis with central scotoma and no eyeground changes, but a very much diminished vision, from ethmoid disease and chronic tonsillitis.

CASE 2. Also a retrobulbar case from a badly diseased maxillary sinus.

CASE 3. One of extraocular muscle involvement and no apparent optic nerve affection from maxillary sinus.

CASE 4. Also a retrobulbar case with an additional hyalitis, from extensive sinus disease.

No doubt the anatomic differences in relationship of nerves to sinuses would account for the dissimilarity of the eye involvement in these cases. None of the scotomata disappeared entirely.

HISTORICAL AND OTHER NOTES REGARDING THE PERIMETER AND PERIMETRY.

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MINNEAPOLIS, MINN.

The history of study of the visual field is here traced. The importance of correct fixation and illumination of the field is pointed out. Methods of taking the field are described, including the direct comparison of fields of vision, of examiner and patient. Use of the campimeter or tangent screen and of the perimeter. An address before the Minnesota Academy of Ophthalmology and Oto-Laryngology, March 9, 1922.

The plan adopted by the Academy during this winter to devote some part of each meeting to a consideration of one particular instrument, of the many that form the armamentarium of the ophthalmologist, is beyond all argument a most excellent one. While in each case the directing intelligence back of an instrument is the imperative essential for the proper performance of that instrument, it is, indeed, well for us all, that we may obtain the finest direction of this intelligence, to understand what we are working with. If we have a clear comprehension of its possible functions, we are then in a correct position to attempt its use, and not before.

Before proceeding to the consideration of the measurements of perimetric deviations, I am sure it will be pardonable to digress, briefly, in order that we may gain some historic background regarding perimetry and the perimeter.

I have been unable to find any monograph or writing that fittingly covers the history of matters pertaining to the visual field; as regards the evolution of the knowledge pertaining to it; as regards the appreciation of changes or manifestations in the field, either of normal or abnormal character; and also a consecutively arranged picture of the evolution of the perimeter or methods of testing the field. I repeat, I find no well correlated, or well arranged discussion of the subject. There is only more or less disconnected and unrelated reference to these matters here and there. Such being the case, it will be my endeavor, briefly, to bring together, in more articulate form, something of the history of the study of the visual field, that we may gain thereby better perspective.

Altho they attained to conspicuous eminence in many matters pertaining to science and the arts, I am unable to find references that would indicate that the early civilizations which existed between the Tigris and Euphrates, or along the Nile, had any worth while conceptions regarding the visual field. It is, however, interesting to observe, that at as early a period as the end of the second century of the Christian Era, we find that Galen in his "Anatomy and Physiology of the Eye" had a surprisingly clear conception of the visual field. In searching thru this work, I find in Chap. XII the following exposition, which is truly most remarkable, considered in the light of that time. "Supposed, that one of the two eyes is gazing at a circle. From the middle point of this circle, which is called the "center", let there be conceived a straight line running as far as to the pupil which is looking at it. This should be, I say, not an angular line, or a bent one, but one like a thin hair or spider's thread, passing from the pupil to the center of the circle, therefore absolutely rectilinear. Further, let us suppose that there are, in addition, a multitude of lines which pass from the pupil to the line which bounds the circle (which is also called the "periphery") these also perfectly straight, like thin gossamer threads, each tight in its turn. Then we will call the figure which is bounded by these lines which run straight to the circle, a "cone" the pupil being the apex of the cone, the circle its base. The line running straight from the pupil to the middle of the center we will call the "axis". Further, we will imagine a millet grain, or other small body to be placed upon the axis, which

extends thru the air from the pupil to the circle's center. Then the center of the circle will be, as it were, covered, and the pupil prevented from seeing it. As soon, however, as it is taken away, either entirely or merely moved to one side, then the circle will be visible again. When one understands that, he will also easily comprehend that every object, in order to be visible, must be free from all obscuration—that is, nothing must lie on the straight line which may be conceived as running from it to the eye."

This primitive, tho clear, expression of the functional activity of the retina, in both central and peripheral vision projected into the visual field, is indeed remarkable for this period of history. I have found great pleasure in this reference, since it is the earliest that I have been able to uncover in a considerable search thru literature.

After this came the long sleep of science and art, and it is a far cry to the middle of the 17th century, when, we again find reference to this subject, at least an intelligent one. Possibly in this long interim, and it is not an improbability, there were references of a more or less vague and indefinite character. But, however that may be, it was for the year 1616 to bring forth a remarkable man by the name of Mariotte, a French priest and physicist of eminence in his day, who discovered that the eye possessed a blind area due to the lack of visual function of the optic papilla. Mariotte was called to London, and there demonstrated the blind spot before the King.

Again we find a period of considerable length, in which, little was done along this line of investigation, until Thomas Young read his famous paper on the "Mechanism of the Eye" before the Royal Society in 1800. In this, Young developed the science of perimetry almost full fledged, as far as fundamentals were concerned, and showed that he had a remarkable conception of the subject. The life history of Thomas Young is one of the most interesting and remarkable to be found among the biographies of scientific men. His mind seemed to have a protean character, in its capacity for grasping many different subjects; from the field of optics, in which he perhaps stands preeminent, to the deciphering of Egyptian hieroglyphics. He was, fortunately, a man in affluent circumstances, and, while a failure as a practicing physician, his name is immortal in the field of science. In 1676, before the time of Young, Willis had referred visual field defects to pathologic changes within the eye, and later the immortal von Graefe, who seemed to have left nothing unstudied and untried in the whole field of ophthalmology, indicated the importance of a study of perimetry in the diagnosis of eye disease, as well as in general disease. This was about the year 1856.

The next step along this pathway carries us to the year 1868, when Foerster presented the first perimeter, as we understand such an instrument at the present time. It is to be supposed, that whatever conception was gained before this year 1867, was not obtained thru the use of a perimeter. However, the implication was very clear, that diseases within the eye, or posterior to it, affecting parts of the perceptive or transmitting apparatus of vision, and evidencing themselves in the field, were probably discovered and studied on flat surfaces, as screens or blackboards. In brief, this perimeter was, in all its fundamentals, the perimeter of today. The radius of the arc had a length of 12 inches, and on this were marked points of appearance and disappearance of a bit of white paper one-fourth of an inch square, attached to a piece of black foil. At the same time Foerster described a chart for recording the results obtained, which indicated that he had very full knowledge regarding the extent and configuration of the visual field, and of the position of the blind spot of Mariotte.

It is quite unnecessary to describe the innumerable perimeters that have been devised since that time. The fundamental principle of a curved surface corresponding to the retinal curvature, upon which the projected field is studied, holds in all of them. The me-

chanical features for the movement of the test object and for registration of the results upon the chart have been gradually improved to a very high degree. However, it is to be remembered, that every instrument should be thoroly tested before the recorded results are accepted. It has surprised me to find how many of the arcs forming the perimeters do not possesss uniform radii of curvature, for with certain materials used for their construction, there is danger of warping, which will change the value of these radii. Again, the registering mechanism is not always correct, the position of the test object on the arm of the perimeter not being correctly noted on the chart. Furthermore, it is very important to observe that the test objects themselves are of a correct size. For instance, commonly used 10 mm. test objects for general office work, are frequently found to be 12 mm., and smaller test objects, supposed to be 2 mm. or 1 mm. vary from these measurements considerably. Again the color saturation, and hue of pigment of the test objects are not always standard.

Correct fixation is a fundamental necessity. It may appear exaggeration that no perimeter is so constructed that correct fixation is assured, even with the exercise of ordinary care by the examiner. I will make one possible exception to this broad statement; the perimeter devised by Ferree and Rand of Bryn Mawr College; who, acting under request of a committee, appointed by the American Ophthalmological Society, have presented an instrument mechanically and optically correct, and which permits of correct fixation. At least two serious results follow faulty head position; first, the nodal point of the eye is excentric in the sphere of which the perimetric arc is a partial circumference; secondly, the departure from a horizontal level, taking the retinal meridians out of correct relation to their corresponding meridians in the field, gives faulty projection in the taken field. The nodal point being back of, or laterally displaced from, the center, gives correspondingly wrong field mapping. In my own hand perimeter with fixed meridians and "three point fixation", correct fixation can be obtained, and the nodal point of the eye under examination correctly placed. However, this is a matter apart from our talk tonight. Hand perimetry has its place, and in a later paper I propose to deal with this phase of the subject. The hand perimeter is not the final arbiter in field mapping by any means, but is useful for office routine, in that it eliminates, by the least possible work, many cases which otherwise would take time and effort connected with fixed charting on the table perimeter.

Now comes to our attention a very important thing in perimetry, aside from all these things—in fact one of the most important,—that is the subject of *illumination*. With the perimeter in the same position on a clear day, the peripheral extent of the field, in the same patient, will vary considerably if taken at 11 o'clock in the morning or 3 o'clock in the afternoon, possibly being from 3 to 12 degrees in some parts of the field less in the afternoon testing. While I believe, for all practical purposes, visual fields taken with care under good average light from 10 o'clock to the middle of the afternoon would record fairly satisfactorily, it must be evident that correct intensity of illumination, and constancy of the same, is vital for accurate results.

As a preliminary to all other methods of testing the visual field, I think an examination by the direct method is not alone indicated, but will greatly facilitate the subsequent tests we make. It is especially valuable for three reasons:

First; it gives us a line upon the patient's power of concentration (exceedingly important) as indicated by his fixation on our own eye, and serves as a good training in this regard for other tests.

Secondly; it gives us some idea, and sometimes a very good one, regarding any general contraction of the field, or possibly of some noticeable incursion into these fields.

Thirdly; it may indicate the pres-

ence of scotomas and approximate their position in the field.

COMPARING FIELDS OF PATIENT AND EXAMINER, DIRECT METHOD. All this information is a very valuable possession as we begin the subsequent testing, either on the perimeter or on the screen. The hit and miss method that is so commonly employed in taking the direct field causes me not to wonder that some have thought it of little value. The following is a rapid and satisfactory *method* to follow out: The ophthalmologist should have two adjustable stools in his office, and these can be quickly adjusted to put the eye of the patient and the eye of the examiner in approximately the same plane. When this test is taken, as is usual, with the patient and ophthalmologist standing, it not infrequently occurs, owing to a difference in height, that this plane varies from 4 inches to perhaps as much as 14 or even 16 inches. The patient—the right eye being tested—gently closes the left eyelid by slight pressure on its outer part, making no pressure on the eyeball. It is sufficient for the ophthalmologist to close his right eye without assistance of the finger. They are separated by about an arm's length. It is necessary to use a dark gauntlet. Instead of holding a piece of cotton in the fingers, as is commonly done, I have 15 mm. spheres in white, red, and green mounted on black handles 10 inches long. The white ball is a pure white, and the others saturated to correct hues of red and green. In the usual way of testing, inaccuracy creeps in, for the hand holding the cotton, or the cuff, may give inaccurate information.

Another error frequently made in making this test is regarding the *illumination*, for the patient or the examiner is placed with his back to the light. It is clear that the one so placed has the advantage of illumination. The sphere used as a test object, or cotton held in the hand, is much better illuminated for the one in this position, and to add to the inequality, the glare from the windows is a further curtailment for the one facing this light. It is to be remembered that the examiner is the registering part of the test, and performs the function of the registering part of a registering perimeter. In perimetry, generally speaking, the examiner is not considered in this matter, here it is different. For this reason, while it does not give the best illumination, it gives equal illumination, to have the line connecting the two stools at right angles to the illumination. This places the examiner and the patient in about the same status. Of course, the ophthalmologist should be assured that his own field is normal, this already having been determined by one of his fellows. With the patient in this position, and with the illumination as described, comparison of the normal field of the examiner with that of the patient may quickly be made. After the peripheral limits are compared, the test object may be carried from the outside toward the center of the field, along radii but a few degrees apart, and in this way the field can be explored quite thoroly. If scotomas of any considerable size exist they will be manifest.

The right hand should be used in taking the right part of each field, and the left hand for the left part of each field, from the position of the examiner. It will become evident to one who will try this more careful direct method, that it is of great assistance when you start to make the test on the perimeter or screen. One finds himself in a position of intelligent expectancy, and the training the patient has secured acquaints him with what is desired of him.

It may be stated axiomatically that the simpler an instrument is, so long as its efficiency is retained, the greater its value, and I am reminded that Landolt has stated that the nearer we bring the finger tips to that portion of the instrument which is to perform the actual work, the better. It is for this reason, in my own perimetric work, I have preferred to the fullest possible extent, the holding of the test object, mounted on a handle, in my own hand. I have carried out the application of this principle in my own perimeter. Having the test object under direct control is important, and this is one reason that the testing in the central part of the field—say within the 35° or 40° circles upon the screen—gives the more detailed results, altho not the only one. Outside of these limits, it is not practical, and such tests

must be caried out upon a curved surface.

THE TANGENT SCREEN. I advise every ophthalmologist to have, as part of his office equipment, a black surface properly marked for the taking of central field defects. It is surprising how easily and inexpensively such a screen may be made, and how excellent a purpose it will serve. While a more expensive, and theoretically more accurate surface, so far as light is concerned, may be obtained by the use of black velvet, a thoroly practical material to use is a very black heavy cotton material. While much of this material has some white in it, for routine office work it is passable. This black square is looped at both ends admitting the passing of light poles, such as are used for curtain hangings, about 3/4 to 1 inch in diameter. This black surface may be laid on the floor and from the center a circle described. The center of the circle is marked with a small white button. Beginning on the horizontal meridian on the right, two large black buttons an inch in diameter are sewed around the circumference, marking intervals of 15° each. On one side of a light stick, the proper radii for these circles are marked for distances of 1/2 meter, and on the other side for 1 meter. The farther away, the larger the projection, of course. For fine testing, especially for relative scotoma, the 1/2 meter distance is desirable. To obtain the radius of any desired circle multiply the natural tangent for the angle of that radius by the distance of the patient's eye from the screen, i.e., the radius of the circle tangent to the screen (R= nt×r.) Natural tangents for any angle desired may be found in trigonometric tables. The elevation of the patient's body must be such that the eye is on the same horizontal plane as the point of fixation marked by the white button, and be directly at right angles to the plane of the screen. The latter is accomplished by having the right foot on a line at right angles to the screen marked on the floor in testing the right, and left foot when testing the left eye. It is exceedingly desirable that the head remain in a constantly fixed position, and for this reason it is desirable to have some form of head rest, which I have on the back of my chair. The patient having been instructed regarding the importance of constantly fixing on the button during the test (as explained previously in the direct method of taking the visual field) the operator begins. It is well to have a handle with test objects, on each side, say 1 mm. on one side and 2 mm. on the other. The handle must be dull black and cast no reflection. The hand making the test should be covered by a black gauntlet.

It is to be remembered that in this method of visual field testing, to retain a perfect fixation will remain in question unless the patient is constantly watched. As the position of the oculist is not so favorable for watching any deviation as in testing with the perimeter, the patient must be warned constantly to fix upon the white spot. One stands as much as possible to one side, and it is my method first to determine the position and extent of the blind spot. As the points of entrance and exit are found, they are marked with a dull black headed pin. If scotomas have been indicated, these are marked with the aid of the points on the periphery of the screen, and the white center of fixation. The marked stick indicates the circle and acts as a radius at the same time. The field as found is then marked on the chart ready for filing.

While it is common practice in testing the blind spot, or abnormal scotomas, to carry the test object centripitally (from without inwards), I have found greater satisfaction contrariwise, i.e., by first testing from the blind area outward in all directions. This gives one a better idea what to test for, and after this the centripetal testing may be carried out. If you will try this, I am sure you will find it to your advantage.

In testing blind areas in the field, if these be absolute, the white test object usually passes rather quickly from out of the normal part of the field into the blind area. In testing for relative scotoma, we may observe not infrequently, a twilight or transitional zone lying between the normal field and area for relative blindness. Not only that, this transitional zone may constitute the entire manifestation so far as the scotoma itself is concerned. In other words, in the very early stages of disease, areas may be found in which the color value

is not lost but diminished. It is exceedingly important that such areas be carefully studied. Very often the color blue will show such areas apart from white, green or red.

THE PERIMETER.

Having gone thus far in the consideration of our subject, we are prepared to discuss the taking of the visual field by the perimeter. The question naturally arises, is it necessary that an examination of the visual field be a part of the routine examination of the eye. Eliminating cases of external eye disease, the visual field test should form part of the data of every case record, and for several reasons. It assists in the completion of the record, and may be invaluable for reference at a later time in that particular case. Again, in studying supposedly normal fields, and where we least expect it, visual field changes may be found that will assist materially in the diagnosis. For example; a case of severe frontal headache may show blind spot changes, or incursions into the nasal field, that give an entirely different aspect to the case.

It is, perhaps, not necessary to make a prolonged study of each field as a routine measure, and the hand perimeter which I have devised will quickly define the peripheral limits of the field, and the disc upon this same instrument may be used to study the conditions within the 20° circle. If field defects are revealed in this way, the patient should be carefully tested on the screen and perimeter.

In testing with the perimeter of the self registering type commonly used; after blinding the other eye, the head is so adjusted that the eye is in the center of the sphere described by the arc of the perimeter. In doing this, not the least important thing is the proper stool adjustment. The horizontal line of the head must be in a plane with the arc of the perimeter when this arc is horizontal. The patient having been previously tested by the direct method, the test object of 10mm. in size is moved in from the periphery. These tests are made at every 15°. If contractions be observed, it is better to make these tests at every 5°, up to the point where the field again reaches the normal limit on the periphery. If the test object after having been marked by the patient disappears, its movement should be continued on the same meridian. If it reappears the point must be marked. This done on the several meridians may reveal an annular scotoma, more or less complete, or bring to attention blind areas to be more fully studied on the screen. Such areas should be carefully studied in blue, red and green. After the field has been studied in this way, until all meridians are taken, the blind spot may be marked out on the screen or scotometric disc.

In order that we may have a more intelligent idea of the value of our results, we must consider certain variable factors which influence the extent of the fields, particularly the color fields. The first, and most important of these factors is the intensity and the uniformity of this stimulus. This involves its control, as well as the brightness of the surrounding field, also the proper exposure and the intensity of the general illumination, and lastly correct fixation.

In closing I have time to speak only of the first of these factors, and to call your attention to the fact of its great importance, for by changes in the intensity of the light upon the test object, we may give to the different color fields, excepting green alone, almost any field extent that we desire, up to the limits of the form field. With high intensity of stimulus the red, blue and yellow fields coincide with those of white. This statement alone is sufficient to impress upon you the importance of a correct intensity of stimulus. It also indicates one of the reasons why any scheme to take the visual field in a dark or darkened room, with simulation of pigment color value by transmitted illumination, is impractical. In this case, also, the question of dark adaptation comes to the fore and adds an important difficulty. It is very evident that a subject so comprehensive as perimetry has now become, can be dealt with in only a very general manner in the time permitted me. Before closing, I desire to state, that thru the efforts of the American Ophthalmological Society for the standardization of perimeter illumination and of test charts, much has been accomplished; so that with fixed conditions and uniform charting much inaccuracy on the one hand and confusion on the other will be eliminated.

EYE STRESS AS A CAUSE OF NEUROCIRCULATORY ASTHENIA AND OTHER FUNCTIONAL HEART DISORDERS.

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The control of the heart by the autonomic nervous system is upset by sepsis, toxemia and the endocrinopathies. A frequent additional cause is eyestrain, resulting in disordered rhythm (neurocirculatory asthenia), dizziness, cold, clammy hands and feet and startled awakening from sleep, with cardiac oppression and smothering. The absolutely exact correction of refractive errors usually brings a permanent cure to these cases.

In the *British Medical Journal* for January 21, and June 4, 1921, Sir James Mackenzie, known as the "Father of Modern Cardiology", emphasizes the point that often the earliest manifestations of disease in an organ are not to be found in the affected organ; but in others remote from it, but dependent on it for proper functioning; so that dizziness in the head, or fainting spells, from too much or too little blood in the brain, or cold feet and hands from too little blood in the extremities, may be the first manifestation of disturbance of the heart. He also emphasizes the fact that the first warning of many diseases is undue fatigue.

For many years it has been the practice of the essayist to ask all patients requiring refraction if they are dizzy, easily tired or winded, with or without cardiac oppression, and if they have cold feet or hands, and it has been a revelation to find how commonplace these manifestations are, altho they are not by the patient in any manner connected with the eyes, and would not accordingly be mentioned by them when seeking relief from known ocular symptoms. In fact it is often in those presenting the least ocular symptoms that the worst constitutional disturbances are found.

For instance, on Sept. 9, 1919, Mr. J., age 32, a muscular and robust looking man, came a considerable distance, because he was having styes; he had misfit astigmatic lenses which he supposed did everything that was to be expected from glasses. On inquiry he was found to suffer from dizziness, car and movie distress, constant fatigue, shortness of wind with palpitation, cold feet, wet hands, gasing stomach, nerve tension, and poor sleep. He was told that he could never make a soldier, whereupon he stated he had been accepted in the draft but after three or four weeks in Camp Lee, had been discharged on account of heart weakness. His errors were properly corrected under complete cycloplegia, and he was asked to present himself at some future time for observation. On Aug. 3, 1920, he reported as being relieved of all symptoms, having gained in weight, and feeling like a new man.

The recent World War, for which so many millions of healthy young men were drafted and examined, furnished a mass of material for observation that could never have been gotten in times of peace, and it was the experience in virtually all the training camps of the U. S. A. that large numbers of otherwise desirable men accepted by the draft boards, had to be dropped out when put to the actual tasks of drilling, etc., on account of their hearts failing to stand the strain, altho they seemed normal. To this condition, Thos. Lewis, of London, applied the name "Neurocirculatory Asthenia", and by reason of its frequent association with other symptoms, also the "Effort Syndrome." All observers of this condition speak of the frequency of such symptoms accompanying it, as dizziness, coldness of feet and hands, often with clamminess, and that many patients report having for many years been subject to quick fatigue or exhaustion.

Had they carried their questioning further, they would no doubt have found equally common in the same subjects, more or less unstable emotional conditions, as irritability, blues, depression, morbid fears, etc., gasing stomachs, poor sleep, bad dreams, and in some cases, a startled sudden awakening from sleep. In most of the subjects, there would be perfect vision, and in many of them no complaint whatever of discomfort about the eyes. The essayist presented a paper before the American Academy of Ophthalmology and Oto-Laryngology, pub-

lished in its Transactions for 1919, also in *New York Medical Journal*, Sept. 25, 1920 on "The Disturbances of the Heart and Liver by Low Grade Astigmatism," in which the statement was made that in his belief, "more people were suffering from their eyes, than with their eyes". In this paper were numerous quotations of statistics from various training camps showing the frequency of neurocirculatory asthenia cases, having also the associated symptoms of dizziness and perverted action of the ductless gland system, simulating hyperthyroidism and goitre.

After the periods of training and fighting were over, there appeared a number of articles dealing with the prolonged cardiac asthenia following various forms of acute infections as pneumonia, empyema, trench fever, etc. Amongst the books in this field were "The Nervous Heart," by Wilson and Carroll, who respectively were on the British and American Committee of Trench Fever Research, and had charge in large military hospitals of the departments for diseases of the heart and arteries. Also the "Soldier's Heart and the Effort Syndrome," by Thos. Lewis, a high authority in cardiology, and head of the largest British Military Hospital in that department. In these books, and also a new work on the heart by Calvin Smith, of Philadelphia, who had large observations in American camps, there is a breaking away from the older ideas of considering anatomic lesions of the heart, stenoses, valvular insufficiencies, etc., as being the prime factors in heart disease, and in place thereof a turning to the condition of the heart muscle and its innervation, with a recognition not only of the bacterial and toxic, but also of the psychic and emotional sources of trouble.

Mysterious vital energy, which can never be fully comprehended, is expended in causing organs to functionate, in cerebration, and in the causing of the emotions. When this becomes insufficient, some of these expressions must of necessity be impaired or abrogated. Hence it is a matter of accident as to whether when there is not enough nerve energy to meet all demands, we have myasthenia, neurasthenia, psychasthenia, or neurocirculatory asthenia; or in case of complete failure of the heart, sudden death. By thinking observers, the response of the circulatory and nutritional systems to extreme sudden, or long continued and less violent emotions, has been recognized for generations; and in the past decade or more, their intimate dependence upon the ductless gland system. Geo. W. Crile has shown how loss of sleep, anxiety, fear, the fight or flight for life, ultimately exhausts the ductless glands, and as well as what usually fills the professional mind—toxemia and sepsis—destroys their function.

In the essayist's belief, equally important, and relatively much more frequent in times of piping peace, is eye stress, usually referred to as eyestrain. In the minds of the laity, and many physicians, this term conveys the idea of ocular discomfort and poor vision, whereas in the worst cases, the vision is usually sharp, and quite comfortable and enduring. Where the sight is blunt or amblyopic, eye stress symptoms are mostly lacking. It is overcoming errors to secure sharper vision that constitutes eye stress. The majority of these are low grade, simple, compound, or mixed astigmatisms, permitting perfect sight, and responding negatively to hasty or perfunctory tests of refraction.

The arrangements that exist in such hospitals and dispensaries as I have seen are only adapted for securing the maximum visual acuity; but it is after determining this that the real test for exact strength of lenses, their combinations, and axes of cylinders necessary to correct eye stress begins. Hence no work of any value in this field can come from hospitals, where the painstaking, time consuming, patience taxing and nerve racking examinations given to his patients by the oculist who believes that his best efforts should be put into his refraction work, equally as into the medical or surgical, can not be obtained.

Refraction should be done in a room sufficiently darkened that no vivid impression, except from the illuminated test letters, should be made upon the

retina, and after it has been worked out as thoroly as possible on the open card containing letters of varying sizes, preferably white letters on a black background, with a much larger black board for a "mat" behind this, it should again be worked to a finer and final test upon one of the several types of boxes with letters on a roller, where only one line of letters and the opening in the box is seen; and a single square letter of the finest line legible used for final tests. By this means no end of cases in which either the presence, strength or axis of cylinder was in error on the open card will be revealed, and in many the results of open card refraction would have fallen short, or entirely failed to secure the best results obtainable. In the presence of the symptoms enumerated, which are due more to astigmatism than any other factor, if the astigmatism it is not in evidence easily, the same painstaking search for it should be made that a good internist gives a chest in an examination for early tuberculosis, or the laboratory man gives to searching slides for its bacillus.

In the essayist's belief, more or less astigmatism is virtually always to be found, and no one should be content until he is satisfied he has worked it out, and worked it out right. This does not mean that every one with astigmatism must have symptoms, as the world is full of astigmatics who have no symptoms, and it requires a certain temperament or combination of circumstances before harmful results can accrue. Croesus in captivity wisely said, "Count no man happy until he is dead." In addition to a reasonable suspicion that symptomless eyestrain, alone, or in combination with infection, general or specific, or toxemia, brings about some of the graver intraocular diseases, there exist the well established observations made in hundreds of cases, that people who had always been healthy and strong may remain after some acute, taxing sickness or surgical operation in a condition of exhaustion or depression etc. for months or years; and only attain their former status of health after the correction of an eye stress, which had previously given them no concern whatever. While most of this class come to the oculist because of some eye discomfort, with or without glasses, I hope the time will come when unexplainable asthenia, neurocirculatory asthenia, and functional heart troubles in general, will be submitted to eye investigation on the same basis as are headaches at the present day.

It has been known from the earliest times, that gas on the stomach is a prolific cause of precordial distress and disturbed heart action, but the world has not yet begun to wake up to the knowledge that gasing stomach, especially in adult, middle aged, and old females, is as commonly a result of astigmatism, as chills and fever were the result of malaria in the Southern lowlands, before the mosquito was shown up as the villain. This trouble raising astigmatism often exists in the presence of such high degrees of hyperopia or myopia, that most examiners would think it of no concern whatever to search for a weak cylinder in the presence of strong sphericals.

In one house might be a large family with several ametropes, and not one of them have any symptoms, because the family constitutional temperament has put their resistance on a plane too high to be affected by the disturbing factor. Next to them might live a family with the same average of errors, and several or all be severely affected. For instance, on Sept. 3, 1919, came Mrs. S., aet 31, having for many years, constantly increasing, the following symptoms: Eyes burn, itch, redden, water, sensitive to bright light, blur after short use; constant dull headache, often severe or sick, dizzy, movie and car sick, severe neck and shoulder pain, easily tired and winded, nervous, gasing stomach, cold and clammy extremities. Under cycloplegia her correction was R. S. $-2.0\frown$Cyl$+1.12$ ax. 97°; L. S. $-1.50\frown$Cyl$+1.12$ ax. 90°, which was given for constant wear.

On April 2, 1920, came her brother, Mr. B. aet. 24, with the same train of symptoms, except the neck and shoulder pain, but he felt miserable and grouchy, and had the same gasing stomach, general fatigue and shortness

of breath, poor sleep, cold, clammy hands and feet, and a pulse of 92 after sitting quietly for an hour. He reports his sister as greatly pleased and better in all respects. His refraction, under cyclopegia was R. S. −2.0⌒Cyl.+2.38 ax. 90°; L. S. −3.0⌒Cyl.+3.25 ax. 97°, which was given for constant wear. On Jan. 6, 1921, came their mother, Mrs. B. aet. 63, who reports her son and daughter as both doing fine. She and her children were stolid, healthy looking, hard working and prosperous Pennsylvania Dutch farm folks, and in no sense would suggest a neurotic type. She complained that the eyes burn, redden, water, pain and blur after short use with "age" glasses, car sick all her life, headaches and sick headaches all her life, until a few years back, when they subsided; as is usually to be expected of eye headaches and sick headaches, but they are the only eyestrain symptoms cured by time. She was nervous, dead tired and short winded, gasing stomach, insomnia so severe that many nights she got absolutely no sleep, cold feet. Reports both children as doing fine, never without glasses. Her final refraction on the roller chart was R. S. +0.25⌒Cyl. +0.75 ax. 60°; L. S. −0.25⌒Cyl.+0.62 ax. 90°, with S. +2.50 added in bifocals for reading.

Every effort was made, as is done in all instances, to hammer into her head the idea that she must wear the glasses all the time, never taking them off except to go to bed, and then wait several months before she could see any improvement; and that the glasses would worry and annoy her at first, but the only thing to do was to keep them on all the time, regardless of what the first feelings or impressions might be. In reply to a letter of inquiry, she says all her symptoms are the same as before; she has not worn the glasses, as they worried her, and made the eyes draw, etc. There is no task harder than to induce old people, and many not old, to wear glasses which they do not feel comfortable in or see clearly thru at a distance at the beginning, no matter how much explanation may be made. Where they will take it, I have for many years found it very helpful to give a ℞ containing Fl. Ext. Hyoscyam., Sod. Bromide., and a dash of Arom. Spts. Ammon. to overcome the nervous irritability due to the glasses. Not much cooperation can be expected from the very ignorant, who are too stupid to comprehend an explanation; nor the self indulgent, pampered, or money spoiled, at the other extreme of the scale, who have no resolution or will power to endure what does not immediately please them, or have the seal of the latest fad or fashion imprinted upon it.

The rapidity with which the young may improve, as well as the severity of cardiac disturbances, is illustrated by the three following cases: Carrie H. age 10, whose two sisters had recently been patients with severe neurocirculatory symptoms of shortness of breath and fatigue on slight exertion, with clammy, cold extremities, etc., greatly relieved by correcting glasses, was brought on Oct. 31, 1921. Following whooping cough last Spring she developed a shortness of breath, with panting and rapid heart action, attacks of rigidity, choking spells, and at times unconsciousness, for which she had been taking medical treatment. On examination it was found that the eyes burn, blur on near use, some headaches and shoulder pain, highly nervous, pain in side from running, cold, wet hands and feet, restless sleep, often wakes scared; pulse 116, after two hours wait dropping to 76. V each 20/25. Each eye takes S. −0.50⌒Cyl. +1.0 ax. 90°; reversal cylinders to ax. 0°, V=20/50. Under cycloplegia each took S. +0.75 ax. 90 R, 97 L. Within three weeks after correction, her mother reports her as greatly bettered. On Mar. 2, and again on July 29, 1922, reports relief all symptoms. Heart not so rapid.

Floyd F., aet 14, March 29, 1920. Certain physicians had proposed removal of tonsils to cure his trouble. His own adviser, an old time country doctor, questioned the propriety of same and referred him to the essayist for an opinion. He was a large unschooled, seventh child in a poor family, with the desire to work, but physically unable

to endure labor, altho strong for a few moments. He was extremely nervous with involuntary jerking, shortness of breath, rapid palpitating heart, pulse 120; after going up a flight of stairs with twenty short steps, 170. Heart heaving, pounding beats; large wet hands, which turned blue very easily. After one hour sitting quietly, pulse dropped to 68. His eyes redden, water, and he has some frontal headaches, and sweaty cold feet. Altho illiterate, he had a bright mind, and it was easy to ascertain that vision was 20/16 each eye. Refraction each S. −0.25⌒Cyl.+0.50 ax. 90° R, 135 L. Under cycloplegia was found R. S. −0.75⌒Cyl.+1.50 ax. 105°; L. Cyl.+1.25 ax. 90°, which was given for constant wear. On June 20, 1920, he made his first report. Pulse 80. No disturbance by stairs; energy to work or play, disappearance blue color of hands, and some diminution of their large size; has gained fourteen pounds in weight, and gotten rid of morbid fears which haunted him, causing him formerly to fear to lose sight of his mother, because of his sense of vague dread. Again seen on Jan. 25, 1921. Has gotten along fine. Heart normal in rate and sounds. A trifle more of astigmatism manifest in each eye. His mother said she verily believed he would have been dead had no relief been found.

Mabel M., aet 17, a well developed last child of large and healthy parents, was brought on Sept. 18, 1922, with the history of eyes that burn, itch, water, sensitive to bright light, blur short use, movie pains, frequent headaches of late, dizzy to sitting, neck pain, nervous and depressed, easily tired, choking spells, gasing stomach with cardiac distress, hands and feet wet and cold, insomnia, bad dreams, wakes startled, inward tremor. On several occasions the smothering and choking spells were so severe on waking from sleep at any hour of the night, that the child felt sure she was going to die, in which belief some of the family shared. Her refraction under drops was R. S. +0.50⌒Cyl.+0.75 ax. 90°; L. S. +0.50⌒Cyl.+0.75 ax. 90°, which was given for constant wear. On Jan. 22, 1923 her mother writes the patient is relieved in every way, and in perfect health, and is a regular participant in all the basket ball games at the school contests.

Chas. T., aet. 18, March 6, 1920. Schoolboy. Eyes burn, itch, redden, water, "play out" on moderate use, frequent frontal headaches, car sickness, dizzy, nervous, neck pain, easily tired and winded, with precordial pain, cold, damp hands and feet. Pulse 76, after stairs, 92. Heart heaving, enlarged and sagged, as apex beat is diffused and far down. This was confirmed by an experienced surgeon, to whom he immediately went when told of the heart involvement. After one hour's wait, pulse was 58. Under cycloplegia he took R. S. +0.75⌒Cyl.+0.50 ax. 120°; L. S. −0.25⌒Cyl.+0.75 ax. 45°, which was given for constant wear. On April 22, father reports him as much better. On Sept. 15, 1920, he reported in person, better in every way; had a job involving much climbing of long stairs, but stood it O. K. Pulse 80; after stairs 92; heart still enlarged, but functioning normally. On Jan. 3, 1921, heart seems normal in size. Relieved of all symptoms except dampness of hands, but this is less. Returned Oct. 3, 1921, with heart size normal, but beginning to get tired and winded again, with neck pain, dizziness, gasing stomach, etc. as well as cold feet and hands. A test under drops showed changes in his astigmatism, whose proper correction caused all his symptoms to clear up. About five weeks later he came saying his troubles were back, which was found to be due to a loose lens having turned in frame.

Within recent years, there is a growing belief in the important role of the ductless gland secretions, singly or in conjunction, so that their undue excitation or inhibition may produce profound systemic results; the thyroid on the heart, the adrenals on blood pressure and the pituitary on skeletal growth, as well as many other things from combined or opposed action. These glands are known to be affected by sepsis, toxemia, excessive emotions, etc. The thyroid gland is the subject of much surgery to restrain

hyperthyroidism. But in some cases the cause of hyperthyroidism itself has been found to be a sepsis or infection, whose removal has caused the symptoms to subside without interference with the gland itself.

The essayist has a belief that eyestrain is a prolific cause of hyperexcitation in some cases, and probably an after reaction of hypoexcitation in others, of the ductless glands, as we have in some cases with the eye stress tachycardia, and in others bradycardia; as in one adult man with all possible symptoms of eye stress since "Flu" three years previously, in which the pulse was 46. The association of astigmatism with hyperthyroidism and exophthalmic goitre has been commented on by Sourasky in the Lancet for Sept. 16, 1922. Out of 32 exophthalmic eyes, 29 were astigmatic, and astigmatism was present in 7 out of 8 eyes where there was no exophthalmos. This author speculates that the lid pressure of the exophthalmus causes the astigmatism, but this does not explain the nonexophthalmic cases. Also he notes the association of many symptoms due to astigmatism, relieved by wearing glasses, and queries as to whether the hyperthyroidism may not intensify the symptoms of a preexisting astigmatism, if not cause it. My creed has been that the astigmatism is a frequent cause, or at least a frequent aggravator, of the symptoms of hyperthyroidism, and not an effect or result of it. Finite mind will probably never grasp the ultimate mystery of life, but we know the old saying of "throwing a monkey wrench into the machinery" is not a bad metaphor as to what happens when some disturbing element is at work to disarrange the delicate balance of the autonomic nervous system.

A case illustrating marked effect on skeletal growth is the following: March 4, 1920, Clarence Y., aet. 19, whose size was small for a boy of 12, complained that his eyes burn, itch, redden, water, pain in bright lights or long use with blurring, headaches, dizzy, easily tired and winded, with irregular pulse, severe insomnia and blues, gets pale from excitement. Under cycloplegia he took R. S. +0.75 ⊃Cyl.+0.62 ax. 75°; L. S. +0.75⊃Cyl. +0.38 ax. 90°, which were given for constant wear. Reported on July 23, 1920, looking larger and older, greatly bettered of all symptoms. In reply to a question if he had had any fights since he got his eyes fixed, he proudly expanded his chest and answered, "Yes Sir; two." He admitted to having felt before so discouraged from his weakness and inefficiency that he almost contemplated self destruction. This statement has been made by several patients after recovery, and no doubt explains the cause of some otherwise unexplainable suicides. By the end of a year, he had caught up in size to his age, and remains strong and husky.

To illustrate the general average run of mild cases, of which hundreds could be cited, is taken one coming in while this paper is being written, because after the lapse of several years of relief, there is a developing recurrence of many symptoms, including damp hands and feet. It shows that we often have to wait a year or more for long established deficiency of circulation as manifested in cold feet and hands to become normal. This fact is emphasized to patients that the longer a condition has existed, the longer they will have to wait for its abatement; but unfortunately the idea is deeply rooted in most minds that if good is to come, it will show at once.

Oct. 10, 1916, Miss C., aet. 34, nurse, For a long time eyes burn, itch, redden, water, play out quickly, severe dizziness, neck and shoulder pain, general fatigue, gasing stomach, blues, cold extremities. Under cycloplegia she took R. S. −1.0⊃Cyl.+1.50 ax. 80°; L. S. −1.0⊃Cyl.+1.75 ax. 120°. She had been wearing each eye Cyl.+ 0.38 axes as in test. She was given glasses as per test, and returned in Aug. 19, 1917, relieved of some symptoms, gaining in weight, but no better of cold feet. On June 4, 1918, reports gain of over 20 lbs. relieved of all symptoms, including cold feet and gasing stomach, continuing until recently recurring symptoms prompted a retest showing sufficient changes to explain symptoms.

Illustrating the severe types is the

following: On July 30, 1921, came Mr. R., aet. 44, a prematurely gray, but otherwise a large, athletic, healthy looking man, because of many recognized eye symptoms. In addition, he was extremely blue, depressed, easily tired and winded, with cardiac oppression, bad gasing stomach, cold wet feet, and had lost his "pep." His pulse was 52, and his systolic blood pressure 110. In his search for relief, he had sixteen months previously spent two weeks in the hospital of a university noted for its leadership in scientific medicine, undergoing investigation, and he could only report they found his blood pressure low. He was wearing bifocals R. S. +0.50 ⁻ Cyl.+0.25 ax. 90°; L. S. +0.50 ⁻ Cyl.+0.38 ax. 90°; Cements, +1.0, added. Under cycloplegic drops, his correction was R. S. +1.50 ⁻ Cyl.+0.38 ax. 105°; L. S. +1.25 ⁻ Cyl.+0.87 ax. 90°. He was given far glasses only, and told to return in time to have bifocals, if he had trouble with close seeing. He did not come back for this until Oct. 19, 1922, when he prefaced his report by saying he wished some prize fighter would challenge him, as he felt so full of vim, vigor and vitality. Four years ago, on account of disability from dizziness, etc. he sold his car. He now ran a new one and was enjoying life and its activities to the fullest. Relieved of all symptoms except cold feet, and that will probably leave in time, as it always takes a year or more to go, when a patient has reached or passed middle life. His pulse is 72. Blood pressure, 118 S.; 60, D.

Most of the illustrations for this paper are selected from recent cases, but as this subject has been under observation for years, one of longer standing will be used to illustrate permanency of relief, as far as I am able to ascertain. Some of these patients are seen years after remaining in good condition with glasses originally fitted, and only came as company with other patients, or when presbyopia overtakes them, demanding stronger glasses for near use.

Sept. 28, 1911, Mrs. B. aet. 41, a spare built, anemic woman, has had a rapid heart for seventeen years past, with nervousness, quick exhaustion; past five years some discomforts in eyes, sick headache and severe ordinary headaches, dizziness and car sickness. She had a strong pulsation in the neck, and had at times past some protrusion of eyeballs, suggesting Graves' disease. In spite of my belief that all ametropes have some astigmatism, under cycloplegia she showed only simple hyperopia of 1. D. each eye, correction of which was given for constant wear.

On Dec. 14, 1911 she was greatly improved in color, had gained 10 pounds when weighed some time previous, improved appetite. Does a hard days work without fatigue; relieved of all symptoms. Pulse fast, but heart feels all right. April 7, 1914. Pulse just inside 100. Has grand endurance. "Can run half a mile without any shortness of breath; work hard all day and be ready for frolic afterwards." In 1922 husband reports she is enjoying perfect health.

The longest list of those who are held down by eye stress, which was symptomless until their energies were sapped by something using up their reserve vitality, is those undergoing major surgery, mostly abdominal, making a recovery from the operation, but remaining weak, easily exhausted, with irritable hearts and cold extremities, etc. It would prolong this paper beyond reasonable limits to cite individual cases, but they often come up like magic when the eye stress is removed, and in some instances were saved from other operations which were suggested as necessary to relieve them. Where operations were done on the diagnosis of floating kidney, visceroptosis etc., without relief, and the patients regained health after a proper correction of eye stress, there remains a reasonable doubt as to whether the patients would not have been relieved by eye correction alone, of their general muscular, psychic, nerve or cardiac asthenia.

There is no age limit beyond which this law does not apply, as numerous observations have been made on patients in their sixties and seventies. For instance, Mrs. N., aet. 64, whom I had

known in previous years as a very large, strong, ruddy and optimistic woman, came on Feb. 5, 1919, because her eyes tired with presbyopic glasses. It was found, in spite of her ruddy color and healthy look, that since double pneumonia and gas poisoning two years before, she had been weak, easily tired and winded, with neck pain, vertigo, cold feet and poor sleep. Her refraction, carefully taken on roller chart, was R. S. +1.0⌒Cyl.+1.25 ax. 165°; L. S. +1.50⌒Cyl.+0.87 ax. 45°, which was given for constant wear; separate glasses for near. In Sept. 1920, two of her married daughters, also having exhaustion symptoms following sickness or surgical operations, each reports their mother as being in fine physical condition and able to do hard work with perfect comfort. She confirms this herself in the fall of 1922.

It matters little whether the patient has been pulled down by the more frequent diseases, as influenza, typhoid fever, etc., or the less common infections, the type is the same. For instance: July 19, 1920, Mr. M., aet. 46, passed thru a severe and long spell of erysipelas, since which his eyes were red and unsatisfactory, and he was very depressed, weak and easily tired and winded, with cold hands and feet and trembly knees. He was referred by his physician for eye examination. He was making no progress in convalescence after sufficient time had elapsed, that normally he should have thrown off the effects of his sickness. Altho he was slightly presbyopic, he was given only the distance correction obtained under cycloplegia, R. S. +1.0 ⌒Cyl.+0.50 ax. 90°; L. S. +0.50⌒Cyl. +0.87 ax. 45°, for constant wear, the presbyopia to be corrected when he asked for it, which he has not yet done. The relief was so rapid that he marveled at it, and he soon felt better and stronger than for many years. On Jan. 27, 1921, he reports a gain of forty-five pounds, and other things in proportion.

On the other hand, how long the warning signs of eye stress may be present before the heart is seriously impaired, is illustrated by the case of Mr. H., aet. 37, a stolid countryman, who was referred by his physician on July 9, 1921. For the past twelve years, the eyes did burn, itch, redden, pain, play out on near use, with sensitiveness to light; past year neck and shoulder pain going to elbow, nervous, gasing stomach, insomnia, for a week at a time, cold, clammy hands and feet, tremor hands and knees. Last Spring he went all to pieces, with no strength or wind for any kind of work since. Under cycloplegia he had R. S. +0.75 ⌒Cyl.+0.38 ax. 180°; L. S. +0.50⌒ Cyl.+0.38 ax. 150°, which was given for constant wear. On Sept. 6 reports feeling better in every way; has gained fifteen pounds. On Nov. 28 reports he has been putting in full time working in a sawmill, and is virtually relieved of all symptoms except car sickness, which also in course of time left, as reported Feb. 16, 1922.

Some of these patients are unaware of their disordered hearts, not having been previously under medical observation. Late in April, 1921, Mr. S., aet. 35, Railroad Station Agent, came because of sundry discomforts about his eyes. He was wearing S. +0.50 both eyes. His pulse was very rapid and heart action irregular; each eye testing S. −0.50⌒Cyl.+1.0 ax. 90°. His eyes burn, itch, ache and tire from moderate use, car and movie headaches, dizzy, nervous, depressed, easily tired and winded, with bad gasing stomach past three years, cold, damp hands and feet. A cycloplegic testing had to be deferred until May 9, at which time his pulse was 150, subsiding to 110 on one hour's waiting. On auscultation his heart beats were too rapid to be counted, and felt on palpation like the flutter of a bird held in the hand. His true refraction was R. Cyl.+2.50 ax. 90°; L. S. +1.0⌒+1.75 ax. 90°, V each 20/40. These were given for constant wear.

He was seen on Sept. 13, and had begun to feel better as to his eyes; pulse still as rapid, but heart beats count same as pulse. He reported again on Dec. 6, saying his improvement was still progressing; his hands were warm and dry and pulse something over 100, as he had been hurrying from place to

place, but it subsided to about 96 in a very short time. He says that his pulse is sometimes not over 90 at the end of a strenuous day's work, and his wife says that it is sometimes as low as 62 when he is asleep. Vision has risen one line in each eye, and axes fixed at 82° R. and 97° L., to which lenses were shifted.

Feb. 7, 1922, is in the main feeling better, with occasional slumps. Has recently walked five miles, which he said he could not have done one year ago. Aug. 3, 1922, pulse inside 100, still improving. Nov. 11, 1922, is very much better, except for occasional slumps when stomach gets out of order; and has changed his vocation to teaching, going about sixteen miles to his school, which necessitates leaving home before day, and not getting back until after dark at this season of year. It is to be expected that it will take many months before such a disordered heart could get back into the ways of normalcy. This has been borne out by cases treated years ago where patients were taking heart tablets constantly, and laboriously climbing stairs which they ultimately could ascend two at a step with ease.

The statement is previously made that an unstable autonomic nervous system must exist in order for eye stress to disarrange the heart function. The following case was known in early life as a "blue baby", and it is not believed for a moment it was the eyes causing blueness in babyhood, but some other factor acting upon an easily upset heart. Oct. 11, 1919 Marie D., aet. 15, was brought because the eyes burn, water, pain from bright light or long use; frequent frontal headaches, often sick; nervous, always tired, easily winded, with palpitation, feet always cold, clammy, perspiring without heat or effort. Frequent blueness from known poor circulation. Her people, being intelligent, became greatly interested when told that correcting the faulty eyes might help her heart action, as they had realized medicines were of only temporary value. On Jan. 15, 1921, she reported being very much better in all respects, especially the circulatory symptoms.

A symptom noted in many children is that they get a pain from running, usually in the left hypochondrium, which causes them to have to drop out of games of sport, while their playmates of equal age and appearance continue going without discomfort. For instance: Oma L., aet. 10, was brought Jan. 5, 1921. Eyes burn, itch, water, sensitive to bright light, pain and blur near use, movie pains, frequent headache, some sick; nervous, easily tired and winded, pain in side from running. Her refraction was mixed astigmatism, but under drops became R. S. +1.0⊃Cyl. +0.75 ax. 90°; L. S. +0.25⊃Cyl.+0.75 ax. 90°, which were given. On June 22, she reported relief of all symptoms, except sick headaches, which are diminishing; July 8, 1922, relieved all symptoms. Can run as much as other children without pain.

Another illustration: Robert S., aet. 14, came Oct. 29, 1920. Eyes itch, water, pain from bright light or near use, blur, movie and car pains, frequent headaches, front and back, sometimes sick; dizzy, easily tired and winded, with pain from running. Each eye tested mixed astigmatism, whereas under cycloplegic drops his refraction was both eyes S +0.25⊃Cyl.+0.87 ax. 180°. On May 28, 1921, returning because of broken glasses; has gotten rid of all troubles, including shortness of wind and heart pain. On Sept. 24 came again because of broken glasses. Is doing fine, and can run all he pleases without discomfort.

Illustrative of the fainting type is the case of Mr. E., aet. 53, who came on Feb. 12, 1920. Sometime previously, while apparently in good health, after starting his early fire and going back to bed, he awakened to find himself surrounded by his anxious family with the doctor leaning over him. He asked what had happened, and was told that he had fallen in a swoon without warning, and had been unconscious for three-quarters of an hour. These spells continued to occur frequently, and with such suddenness that he felt fortunate if he could grasp some support in time to prevent falling. Having a personal acquaintance with an eminent surgeon in Pittsburgh, he

consulted him, and was referred to an internist, who in turn advised him to have his eyes examined, but also put him on medical treatment. As far as he felt, his eyes had given no trouble, and he was getting on very well with simple presbyopic glasses. He had a vertical strabismus, and double vision with red glass. In spite of his age, his eyes were refracted under homatropin, showing R. S. +0.50⊂Cyl.+0.50 ax. 75°; L. S. +0.50⊂Cyl.+1.25 ax. 90°, bringing out +0.75 more cylinder in left than showed before the drops, and the same was given for constant wear. On Jan. 13, 1921, reports he has for past nine months had no fainting spells; and has also been taking medicine. On Dec. 4, 1921, says he never felt better in his life, being in splendid health; never has any more "naps". Has been taking at night luminal, and a tablet after meals supposed to be a mercurial. These sudden swooning spells are a variant of vertigo, many cases of which with falling have been relieved by glasses, after medicines have failed.

On Dec. 3, 1921, Miss M., aet. 60, teacher, hale and sturdy, and much younger looking than her age, came because of floating specks in front of eyes, which were comfortable and enduring in use, with the S.+3.25 lenses she had. A record was found showing that she had come on Dec. 31, 1904, with no symptoms except that her eyes had begun to play out for night use. She showed no fault except beginning presbyopia, but to guard against latent errors, test drops were used, and no error recorded, as she was given only S.+1.0 to use in reading, which had since been increased by opticians as needed. Inquiry revealed that she had at times been car sick, had slight dizziness, was nervous, irritable, easily tired and winded, with palpitation at times. Pulse was 120; after stairs, 134. Her refraction was R. S. +1.25⊂Cyl. +0.38 ax. 120°; L. S. +1.0⊂Cyl.+0.62 ax. 30. V. each 20/20. Gave correction for constant wear, with +2.50 added for near. On Jan. 17, 1923, writes she did not have any trouble from palpitation for several months after getting glasses. Confirmed later by landlady, with whom she lives. Pulse 93. At present some trouble with stomach. This case is quoted because of absence of all symptoms in the eyes themselves; but experience in the past has proven that it is usually the low grade astigmatisms with axes inclined that make the most trouble, or larger astigmatisms only approximately corrected, leaving small amounts to be compensated by eye stress. Just as in the moral world, a half truth is often more harmful than a whole lie: an approximative correction of a large trouble may cause eye stress, where only poor vision was before.

In the articles written by army men connected with the late war, in description of these neurocirculatory asthenias, free use was made of the expression "constitutional inferiority" to explain the symptoms, but a proper correction of their refraction would remove this stigma from a large percentage so classified.

Ophthalmic Literature for March 1921, abstracted an article by Gonzalez in Revista Cubana de Opt. 1919, p. 553, on unusual complications of eyestrain, including tachycardia, bradycardia and sundry other things, which had not heretofore been attributed to eyestrain. Not being able to read Spanish, I secured a translation of this exhaustive article in order to study it fully. He shows by illustrative cases that the vasomotor sympathetic system may be so disarranged, that by permitting congestion or anemia of the brain centers, simulation of organic damage to them may be manifested by amnesia, aphasia, muscular paralysis etc.,* just as real as if a true apoplexy had occurred, but clearing up entirely in short space of time, which organic disease could only do slowly, or not at all. He describes unilateral congestion of the face and lobe of the ear as an index of the cerebral circulation. This phase of the subject was new to me, but several cases of aphasia have since presented which conform to his description.

Testing eyes for the objective outlined in this paper is a matter of psy-

*See article by Banister in Amer. Jour. of Oph., May 1923, p. 396.

chology as much as of optics, and the patient's mental measure must be taken as to his ability for accurate observation, sustained attention, discriminative ability, and personal effort, all or any of which may range from 0 to 100% of what it should be; to say nothing of being on the constant look out for signs of fatigue or exhaustion under tests. Answers must be assayed as to their value or worthlessness, consistency or contradictions. For instance, there are people supposedly educated, who if given three answers as to which was roundest, a cracker box, a stick of stove wood or a sphere, would cast one vote for each candidate with the utmost equanimity.

The essayist would like to submit to professional investigation the value as a symptom pointing to eye stress, in apparently healthy and robust children, of a pain in the side low down, produced by running, which causes them to have to stop and rest, while their companions continue going. This is likely a heart tug at the diaphragm, and in a number of instances, has been relieved by correcting the refraction, and a good many adults with cardiac weakness from the same cause admit having been so affected during their childhood.

The idea has several times crossed the mind of the essayist, that angina pectoris may be a discharge of cumulative eye stress, the equivalent of a fainting spell, an epileptiform, or vertiginous attack, with the difference that when the heart stops in spasm there is no comeback, whereas when cerebration is arrested, life goes on until the storm can blow over, and cerebration be taken up again. The severity of the oppression of breathing, precordial pain, numbness or pain in arm even to finger tips, in many cases of eye stress, relieved by correcting lenses, is very similar to the classic descriptions of angina pectoris. Since the first description of this disease by Heberden about one hundred years ago, little has been added to its symptomatology or etiology, which was supposed to be due to hardening of the coronary arteries, except that the verbiage of the first half of the century called it ossification or calcification of the arteries, and that of the last half speaks of it in terms of atheroma and arteriosclerosis. When it is considered how common these conditions are when there has been no angina, it strikes me that deducing therefrom the hypothesis of their being the cause of angina is illogical.

A hopeful breaking away from this hoary belief has been made by Sir Clifford Albutt, who in a symposium on heart diseases published in the Cardiac number of the New York Medical Journal, Feb. 15, 1922, wholly disclaims any belief in the disease being due to blocking of the coronary arteries, but expresses his preference for the theory of Walter Verdon. One who peruses the volume on angina pectoris by Verdon, will see that he attributes it to a neurosis excited by gas pressure. He gives the life history of numbers of patients, who usually experienced relief when the gas was eructated or expelled as flatus. It is shown elsewhere that gasing stomach is one of the commonest manifestations of eye stress, especially in the elderly.

My work does not bring me in contact with this disease, but I recently tested the eyes of a woman of sixty-three who had gone thru life without glasses, she being myopic with astigmatism in each eye. In addition she was dizzy, had cardiac oppression, with pain in arm, gasing stomach and cold feet. She would not wear glasses, as they worried her. Not long after these observations, she died suddenly, being certified as death from angina pectoris. The widows of two personal friends who died suddenly in the prime of life from angina pectoris, replied to my inquiries, that their husbands had suffered for a long time from many of the characteristic symptoms of eye-strain as delineated to them.

The essayist would like also to propose as a speculation, difficult to prove should it be true, of a certain proportion of cases of sudden death from heart failure, where there had been no previous disease or angina, as being due to long continued, maybe symptomless eye stress, with the addition of some factor, trifling in itself, which determines the time of breakdown. If enough cases similar to the following

could be gathered, more light would be thrown on this subject.

On Jan. 17, 1920, came Mrs. C., aet. 59, a large framed, ponderous woman, because her eyes were not comfortable with bifocal spherical lenses she was wearing. Pupils were small and sluggish, and best vision possible was 20/75 each, with hazy vitreous to explain low vision. Her refraction was found to be R. S. +1.0⌒Cyl.+1.50 ax. 180°; L. Cyl. + 2.0 ax. 180°. For years she had the typical eyestrain symptoms; eyes burn, itch, redden, water, pain in bright lights, play out on short use; frequent headaches, sometimes sick; dizzy, neck pain, nervous, insomnia, easily tired and winded by even walking on a level. Heart was jerky and hardly audible. She was put on medical treatment for the eyes, and told glasses would be given after they cleared up. On Feb. 17 following, she was in a neighbor's house in best of spirits, helping with dishes, when she instantly dropped dead.

On April 18, 1903, Mr. B., aet. 39, came because his eyes were breaking down for near work, with +S. glasses used only for reading. Under cycloplegia he had 3. D. hyperopia in each eye, but he absolutely refused to wear glasses constantly, and no argument or persuasion was of any avail, and the record states the case was dropped. On a certain morning recently his friends and neighbors were shocked to learn he had died the night before, with no preliminary sickness, except the evening previous a cardiac distress for which his physician had ordered him to go to bed for a complete rest.

A cumulative stress long enough continued, may finally bring a mind or a heart to the point where the merest trifle can shatter the one, or stop the other. If anyone doubts how little a thing may be required to bring this calamity upon an organ already stressed to the limit of its endurance, let him reflect on the camel, whose back the last straw broke.

TERATOMA OF THE LACRIMAL GLAND.

LLOYD B. WHITHAM, M.D.

BALTIMORE, MD.

The case here reported is a pathologic rarity. Examination of the mass removed showed it consists of fatty tissue in which was imbedded a tooth shaped mass of bone.

The latest and most complete review of the subject of tumors of the lacrimal gland appeared in the June, 1921 number of this journal, and was the work of Dr. Laura Lane of Minneapolis. The ground has been so painstakingly covered by her that the writer will do no more than dwell upon the high lights of the subject and report his patient's case.

Growths of this gland are, even in general, a rarity; as attested by the fact that only 229 instances have been reported in a period of 323 years, the first case being recorded in 1598 by Fabricus Hildanus, and the first microscopic examination performed by Becker in 1867. Other noteworthy collectors were Greeves, Birch-Hirschfeld, Lagrange and Warthin.

The latter collected 132 cases, with the record of but one dermoid and no teratoma, while in the pathologic classification of Lane's 112 lacrimal gland tumors there was but one teratoma. The available figures, therefore, demonstrate the infrequency of this particular pathologic entity in this situation.

Three general divisions of lacrimal gland growths are noted: firstly, solid tumors or neoplasms; secondly, cysts or dacryops; lastly, symmetric, tumor like enlargements due to Mikulicz' syndrome or lymphomata.

There has been considerable theorizing as to the origin of these tumors, in general, Warthin believing that the majority of them are probably mixed tumors of endothelial origin and similar to those of the parotid and submaxillary glands.

While most writers contend that they are not malignant, or only rarely

so, Lane's studies failed to substantiate this, and yielded a death rate of 12.63%. In 95 cases, there was recurrence in 19 and metastases in 7. The writer is happy to state that his case, five years after extirpation, has had none of these unfortunate sequels, as will be noticed in the following history:

CASE. P. J. O'N., New Britain, Conn., 21 yrs., male, single. May 27, 1918. At five years of age, a large, coarse hair was, for the first time, noticed protruding from the palpebral fissure of the left eye near the external canthus, apparently growing downward from beneath the upper lid. In the interim nothing was thought of or done about it other than clipping it with scissors, from time to time, when it became so long as to be conspicuous or inconvenient. About one year ago he first noticed the tumor, then half its present size and usually of an orange color, one day pale, the next day reddish (chromatic characteristics obtaining to this day), and lying in the left, superior conjunctival fornix. Since then he has remarked its rather rapid, but otherwise uneventful growth. Tho producing a "spongy feeling" subjectively, it has never excited more of a symptomatology than an occasional blurring of vision. Two years ago this eye was scratched with a hatpin but without serious results. Previous family, ocular and medical histories, negative.

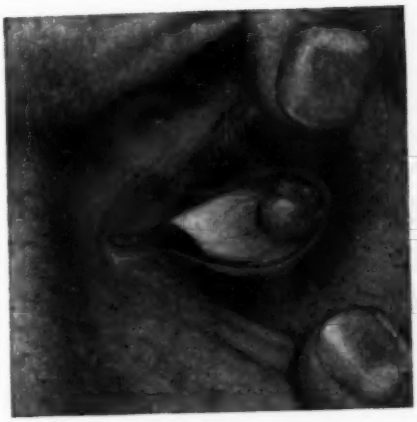
Present condition: There is a large, pedunculated, multilobular tumor, of firm consistency, convex anteriorly, but moulded concavely posteriorly, from its pressure upon the globe, on which it rests and against which it is held by the lid. Originating from the region of the accessory lacrimal gland, it extends downward into the opening of the palpebral fissure for about 7 mm., and is quite conspicuous, apparently interfering with the left eye's supraduction and abduction. Its surface is moist and its color a grayish, salmon pink. Subsequent visual, ophthalmoscopic and refraction tests yield normal findings.

Operation: June 4, 1918. Under local anesthesia, the tumor was thoroly dissected from the attachment in the lacrimal gland and excised, the opening thus made being brought together by a suture. Recovery was uneventful and the patient returned to work in a few days.

The tumor was split with a scalpel, and exposed to view what appeared to be a small, well formed, sharp tooth, possessing a perfect covering of glistening, white enamel. There was a definite, outer, limiting, fibrous capsule, with what seemed to be fibrous septa between the various lobes, and an inner, yellow line, presumably fat; and there was some definite arrangement of the whole, the different tissues being segregated as far as the eye could see. As it was not cystic, dermoid cyst was ruled out and the surgical diagnosis of teratoma was made, the specimen being given to the pathologist, Dr. Benjamin Kline, who, having examined the tumor, placed it in decalcifying solution for later sectioning and subsequently reported:—

Pathology: "Specimen consists of a tumor mass about 1.5x0.8x0.8 cms. solid. On section, the mass is found to be contained within a thin, fibrous capsule which is attached to a small mass of spongy tissue, suggesting glandular structure. The tumor is composed of a mass of yellowish fatty tissue, embedded in which there is a tooth shaped mass of bone like tissue. *Microscopic section* shows areas composed of loose connective tissue with smooth muscle cells scattered thruout. In addition to these cells, there are striated muscle cells showing branching. Embedded in the connective tissue there is an area having the appearance of normal bone, triangular in shape. There are scattered osteoblasts visible and, in one corner, true Haversian systems. In this region there is a thin layer of flat cells covering the bone. In areas embedded in the connective tissue there are islands of fat cells. In places covering the tissues mentioned above there is a syncitial like layer of cells. *Diagnosis*: Teratoma."

When patient was last heard from, Dec. 19, 1922, there had been no recurrence and the eye was in a normal condition.



APPEARANCE PRESENTED

TUMOR REMOVED

TERATOMA OF LACRYMAL GLAND (WHITHAM'S CASE)

SUBHYALOID HEMORRHAGE (CULLOM'S CASE)

Dr. Clifton Miller, in the January, 1923 *Southern Medical Journal*, reported a case which was, in its symptomatology and general characteristics, almost similar to the writer's, even to the finding of a rudimentary tooth in the tumor. However, the growth was found cystic, it sprang from the transitional fold of the superior conjunctiva and was diagnosed, grossly, as a lipodermoid.

SUBHYALOID HEMORRHAGE.

M. M. CULLOM, M.D.

NASHVILLE, TENN.

On May 3, 1923, I was consulted by Mrs. E. D. E., age 36, on account of poor vision in right eye. Eight weeks ago she had an attack of influenza followed by tonsillitis. During the attack of tonsillitis she suddenly lost the vision of her right eye for objects in front. Peripheral vision was maintained. Objects looked at with the right eye appeared to be red. This symptom suggested a preretinal hemorrhage and an examination of the fundus disclosed a large hemorrhage in the macular region. The three cardinal diagnostic points of subhyaloid hemorrhage, and an examination of the red appearance of objects seen by the affected eye, a horizontal line running across the top of the hemorrhage and the inverted "D" shape of the hemorrhage.

The hemorrhage comes from a retinal vessel, and is in front of the retina and behind the hyaloid membrane which separates the vitreous humor from the retina. The horizontal line separating the upper, dark grayish portion from the lower, dark red portion, is caused by the red corpuscles settling to the bottom while the blood is still fluid. On account of the hemorrhage being in front of the retina the prognosis for recovery of sight is generally good.

Subhyaloid hemorrhage is comparatively rare. The writer has seen only two cases, the other while on house service at the Manhattan Eye and Ear Hospital in 1897. Oatman's Atlas depicts a case, but curiously enough fails to mention in the history the two main diagnostic points, the red appearance of objects, and the horizontal line dividing the upper from the lower part. Fuchs describes the condition as does de Schweinitz, noting the horizontal line, but both fail to mention the subjective symptoms of objects appearing red. Weeks does not mention the condition. In the Atlas of W. Adams Frost there is a beautiful picture of the condition, in the history of which the red appearance of objects and the horizontal line are both noted.

August 21, 1923. An examination of the fundus shows that the hemorrhage has been entirely absorbed. R. V. 20/15.

Treatment consisted of enucleation of the infected tonsils and small doses of potassium iodid and bachlorid of mercury internally.

THE USE OF THE PRISM SCALE TO NEUTRALIZE AND CENTER SPECTACLE LENSES.

S. Lewis Ziegler, M.D.

PHILADELPHIA, PA.

This paper describes the prism scale and method of using it. Practical demonstration of its readings and a table of resultant and equivalent prisms produced by various oblique positions are also given. Read before the College of Physicians of Philadelphia, March 15, 1923.

About 30 years ago I presented what was then called "A Convenient Prism Scale"[1] before the Ophthalmological Section of the American Medical Association, in Milwaukee, on June 9, 1893. This scale was first devised for the sole purpose of measuring the strength of prisms, but I soon found that it possessed an additional value as a daily help in neutralizing and centering spectacle lenses, and especially in testing bifocal segments for relative vertical decentration. Others may have utilized it for this purpose, but I have seen no record of such a development and thought it might be wise to call again attention to the technic of its practical application.

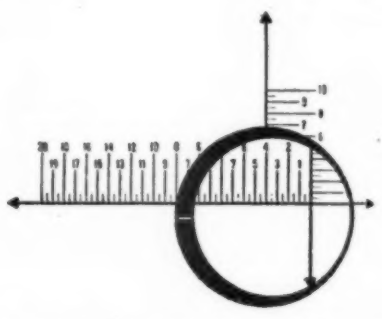


Fig. 1.—Prism scale used to measure strength of prism. Scale seen thru prism displaced horizontally to right so that vertical line 4 coincides with vertical base line.

The prism scale as originally presented was based on a two meter range, but its daily use soon demonstrated that a one meter scale was more advantageous, especially for the shorter range of a trial case. In submitting this revised technic I will offer for consideration the following points:

(1) A description of the prism scale.

(2) Its method of use.

(3) A practical demonstration of the various prism readings.

(4) A table of resultant prisms (and their equivalents) which avoids fractions of a degree and is, therefore, more practical for the optician to grind.

DESCRIPTION OF PRISM SCALE.

1. The prism unit of this scale is adjusted to measure "a deviation of one centimeter at a distance of one meter."

2. It possesses both a horizontal scale in black (20°) and a vertical scale in red (10°).

3. The index line of one scale becomes the base line of the other scale and vice versa, each line terminating in an arrow head indicator.

4. The angle and strength of resultant prisms can be measured, and spectacle lenses neutralized or centered at the junction of the two scales.

METHOD OF USE.

1. To Test the Strength of a Prism: Hang the prism scale on the wall (above the refraction case, or in the lid) on a level with the eyes of the observer. Hold the prism about nine inches in front of the eyes and at exactly one meter from the scale. Close one eye and with the other look at the scale, both thru the prism and over it. A comparison of these two fields will give the required registration. Each field must contain either the indicator singly or the numbered graduations singly, the two fields being in conjunction at the margin of the lens.

Rotate the prism until the base line seen thru the prism is continuous with the base line of the scale. Always keep the plane of the prism parallel with that of the scale and on a level with it. The index line will be displaced along the scale until the indicator stands opposite the proper numbered graduation. By rapidly moving the prism up and down along this graduation it can be seen whether the

index line accurately coincides or not. When it does the prism strength is correctly registered. If it is a resultant prism, the vertical and horizontal readings may be registered separately, or the prism can be rotated so as to be read on one scale and the axis noted on a protractor.

II. To Neutralize and Center a Spectacle Lens: (A) Move the spectacle lens backward and forward and note whether the lines widen or contract as the lens goes toward the scale. If they widen it is a plus lens, if they contract it is a minus lens. If this movement is manifested in all directions the lens is a spherical, if in only one meridian it is a cylinder. The axis is determined by rotating the lens until the lines are straight, and noting the angle on a protractor.

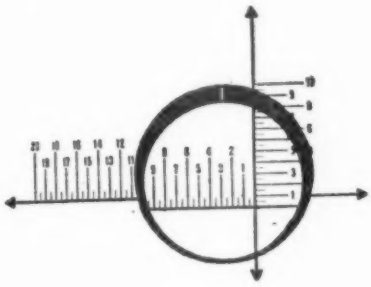


Fig. 2.—Scale seen thru prism displaced vertically downward so that horizontal line marked 1 corresponds with horizontal base line.

(B) If the formula of the spectacle lens is known, place the neutralizing sphere or cylinder over the anterior surface of the spectacle lens with all centers coinciding, and again move backward and forward to see whether the lines on the scale widen or contract. If the lines appear crooked rotate the neutralizing cylinder until the lines become straight. Prismatic displacement of the lines during rotation must be differentiated from cylindrical distortion. Finally, test the neutrality by moving the superimposed lenses backward and forward three times with a short sharp jerk. Then rotate twice to prove the axis. When the field appears perfectly flat, note any decentration or take the prism reading as in I.

(C) In bifocal lenses we should test (1) whether the segments neutralize, (2) whether the centers are too high or too low and (3) whether there is relative vertical decentration, which would cause an artificial hyperphoria at the patient's near point.

Demonstration of Prism Reading.

(1) The prism reading may be taken in either of two ways for each position of the prism.

(2) The equivalent and resultant prisms are both recorded in the table attached to the face of the scale. They can be ordered either way and neutralized accordingly, always remembering that "the vertical prism must be exact but the horizontal prism may be approximate," according to the formula shown in the table.

(3) The resultant prism will have

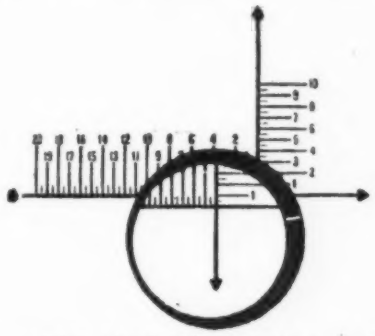


Fig. 3.—Prism placed obliquely axis at 15 degrees. Scale displaced down 1 and to the left 3 and 3/4.

its base rotated above or below the horizontal base line, as the reading may indicate. Thus, if we wish to prescribe the equivalents R O.D. P 1° base up ⌣ P 4° base out, we would order the resultant, R O.D. P 4° base up, axis 165°. This equals P 1° base up ⌣ P 3-3/4° base out (see table) in which P 4° is rotated out and up 15°.

(4) If the lens is held evenly it can at once be seen (a) whether the lens is properly neutralized, (b) whether it is accurately centered and (c) whether the prismatic strength is correctly measured.

Prism Base Horizontal. Fig. 1 shows P 4° base out, the indicator standing over the gradation (4°) as viewed thru the prism field.

Prism Base Vertical. Fig. 2 shows P 1° base up, with its axis lined up on the vertical base line, the gradation (1°) seen thru the prism field and the indicator at the right.

Prism Base Oblique: Resultant Prism. Fig. 3 shows R O.D. P 4° base up axis 15°, which is rotated in and up, 15°.

Wall and Ochs, of Philadelphia, have published this prism scale for me, with table of resultant prisms on the front and the method of its use on the back.

TABLE OF EQUIVALENT PRISMS AND THEIR RESULTANTS.

EQUIVALENTS		RESULTANTS	
Exact Vertical Prism.	Approximate Horizontal Prism.	Resultant Prism.	Angle of Rotation.
P ¼ °	P 1 °	P 1 °	ax. 15 °
P ¼ °	P 1½ °	P 1½ °	ax. 10 °
P ¼ °	P 2 °	P 2 °	ax. 8 °
P ¼ °	P 2½ °	P 2½ °	ax. 6 °
P ¼ °	P 3 °	P 3 °	ax. 5 °
P ¼ °	P 4 °	P 4 °	ax. 4 °
P ¼ °	P 5 °	P 5 °	ax. 3 °
P ¼ °	P 6 °	P 6 °	ax. 2 °
P ½ °	P ⅞ °	P 1 °	ax. 30 °
P ½ °	P 1⅜ °	P 1½ °	ax. 20 °
P ½ °	P 1⅞ °	P 2 °	ax. 15 °
P ½ °	P 2½ °	P 2½ °	ax. 12 °
P ½ °	P 2⅞ °	P 3 °	ax. 10 °
P ½ °	P 4 °	P 4 °	ax. 8 °
P ½ °	P 5 °	P 5 °	ax. 6 °
P ½ °	P 6 °	P 6 °	ax. 5 °
P ¾ °	P ¾ °	P 1 °	ax. 45 °
P ¾ °	P 1¼ °	P 1½ °	ax. 30 °
P ¾ °	P 1¾ °	P 2 °	ax. 22 °
P ¾ °	P 2⅜ °	P 2½ °	ax. 18 °
P ¾ °	P 2¾ °	P 3 °	ax. 15 °
P ¾ °	P 3⅞ °	P 4 °	ax. 11 °
P ¾ °	P 4⅞ °	P 5 °	ax. 9 °
P ¾ °	P 6 °	P 6 °	ax. 7 °
P 1 °	P 1⅛ °	P 1½ °	ax. 40 °
P 1 °	P 1½ °	P 2 °	ax. 30 °
P 1 °	P 2¼ °	P 2½ °	ax. 24 °

EQUIVALENTS		RESULTANTS	
Exact Vertical Prism.	Approximate Horizontal Prism.	Resultant Prism.	Angle of Rotation.
P 1 °	P 2⅝ °	P 3 °	ax. 20 °
P 1 °	P 3¾ °	P 4 °	ax. 15 °
P 1 °	P 4¾ °	P 5 °	ax. 12 °
P 1 °	P 5⅞ °	P 6 °	ax. 10 °
P 1½ °	P 1 °	P 2 °	ax. 80 °
P 1½ °	P 1⅜ °	P 2 °	ax. 45 °
P 1½ °	P 2 °	P 2½ °	ax. 36 °
P 1½ °	P 2¼ °	P 3 °	ax. 30 °
P 1½ °	P 3⅝ °	P 4 °	ax. 22 °
P 1½ °	P 4⅝ °	P 5 °	ax. 18 °
P 1½ °	P 5¾ °	P 6 °	ax. 15 °
P 2 °	P 1½ °	P 2½ °	ax. 50 °
P 2 °	P 2¼ °	P 3 °	ax. 40 °
P 2 °	P 3½ °	P 4 °	ax. 30 °
P 2 °	P 4½ °	P 5 °	ax. 24 °
P 2 °	P 5⅞ °	P 6 °	ax. 20 °
P 2½ °	P 1¾ °	P 3 °	ax. 55 °
P 2½ °	P 3 °	P 4 °	ax. 40 °
P 2½ °	P 4⅛ °	P 5 °	ax. 32 °
P 2½ °	P 5½ °	P 6 °	ax. 25 °
P 3 °	P 2½ °	P 4 °	ax. 50 °
P 3 °	P 4 °	P 5 °	ax. 36 °
P 3 °	P 5⅛ °	P 6 °	ax. 30 °
P 4 °	P 3 °	P 5 °	ax. 50 °
P 4 °	P 4¼ °	P 6 °	ax. 42 °
P 5 °	P 3⅛ °	P 6 °	ax. 60 °

NOTE.—All the axes recorded in the above table refer to only one side of the horizontal plane, but apply as well to the other side. Thus, P 4 ° ax. 15 ° on one side would read P 4 ° ax. 165 ° on the other side (ax. 30 ° would thus become ax. 150 °). In any of these positions the base may be either up or down. Each resultant prism may, therefore, occupy one of four positions e. g., P 4 ° base up ax. 15 °; P 4 ° base down ax. 15 °; P 4 ° base up ax. 165 °; P 4 ° base down ax. 165 °.

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NOTES, CASES, INSTRUMENTS

CATARACT CAUSED BY FISH HOOK IN EYE, VISION RECOVERED.

HOWARD CLARKE, M.D.

HONOLULU, T. H.

Injuries of the cornea, iris and lens by penetrating foreign bodies are of not infrequent occurrence. It is only occasionally, however, that results are obtained as excellent as in the case I am now reporting.

J. A., a Hawaiian, age 22, employee of Waimanalo Sugar Plantation was

Fig. 1.—Diagram showing position of fish hook after entering the eye, perforating the iris twice and causing traumatic cataract.

brought to the Clinic, at 9 p. m., September 25, 1922, giving the following history:

"I was within a few minutes of quitting work at 5:15 p. m., when I stopped to watch a Filipino fisherman with his bamboo pole, who baited his hook with a piece of octopus and cast his line. The hook struck me smack in the eye."

An emergency dressing of cotton was applied and held in place by a handkerchief bound around his head, the patient was driven on rough roads in an automobile and not seen by me until four hours later. Upon removing the handkerchief and cotton I noted the following condition: Fish hook with part of line attached penetrating the left cornea near the limbus, perforating the iris in two places with the barb of the hook penetrating the lens in the pupil as shown by the illustration. The aqueous had escaped and the anterior chamber contained some blood. The patient was taken to the Queen's Hospital and operated on immediately. After cocain anesthesia a cataract knife was used to enlarge the wound of entrance into the cornea, and the shank of the hook served to pull the iris thru this opening until two snips of the scissors performed an iridectomy and enabled me to extract the hook from the eye. The anterior chamber was irrigated with normal saline solution which removed the blood and a large amount of lens substance. Atropin was instilled and a bandage applied which was not removed until ten days later.

October 18. Vision was 20/200 w+10 sph. correction. Atropin was instilled. Fundus details could not be made out because of secondary cataract formation. November 17—Vision had decreased to being able to count fingers at five feet. Eye still irritated. December 7—The Industrial Accident Board sent the patient to its specialist who reported that the end result of any further operation on this eye would not restore the vision to anywhere near the normal. There was irritability with latent inflammation, partial opaqueness of the lens with adherence to surrounding structure and evidence of liquid vitreous. Any attempt at removal of the lens would cause a probable loss of vitreous and collapse of the eyeball with a possibility of sympathetic ophthalmia in the other eye.

Upon the strength of this report the employers were directed to pay full damages for the loss of the eye, and I had difficulty to persuade the patient to allow us to operate on him. I have the profoundest respect for the judgment and ability of this ophthalmologist, who is one of the best in the Territory, but I believed the condition of the patient could be improved notwithstanding the risks involved.

December 12—a needling operation was performed which gave vision a

week later of 20/100 with +12 sph. correction. February 3, 1923—a final operation was performed, in which the opaque capsule was seized by a capsule forceps and gently torn by twisting motions from its attachments and extracted from the eye. February 10, the bandage was removed and the eye obtained 20/20 vision with +10 sph. correction. This vision has been retained ever since. The fundus is now clearly visible, is normal in every respect, and the eye is without the slightest sign of irritability and is useful to him. The cosmetic effect is excellent.

Injuries of this sort do not always run such a favorable course. They usually run an unfavorable course as infection from such a dirty object is likely to cause a panòphthalmitis, with necessity of enucleating the eye; retinal detachment or choroiditis are likely to cause defective vision; and, of course, sympathetic ophthalmia is among the possibilities. The fact of the vitreous being fluid added to the operative difficulties and the method of removing the cataractous lens capsule was, of course, hazardous, but warranted by the result obtained. In this case there were no complications of hemorrhage, prolapse, iris or vitreous loss, and the retina and choroid behaved beautifully.

A CILIUM IN THE ANTERIOR CHAMBER FOR NINETEEN YEARS.

HARRY S. GRADLE, A.B., M.D.

CHICAGO, ILLINOIS.

B. M., age 24 yrs, came because of a chronic blepharoconjunctivitis. He gave a very questionable history of trauma to the *left* eye at the age of five. Both eyes presented the typical picture of chronic semiulcerative blepharoconjunctivitis. On careful examination, the following picture was found in the right eye:—Eye pale and does not redden on manipulation. 3 mm. from the upper limbus is a 3 mm. long horizontal scar in the cornea. The iris shelf is attached to the posterior surface of the scar. Cornea is otherwise normal.

Running nasally from under the adherent portion of the iris shelf to the outer limbus at axis 40°, where the end is hidden under the overhanging sclera, is a straight, slightly tapering, yellowish rod, merely a few lines in diameter. It appears to be composed of a fairly solid substance and is of tubular construction. Under the corneal microscope with focal illumination, it can be recognized as a depigmented cilium. There is some slight scattering of irregular brownish-yellow iris pigment, especially on the anterior capsule of the lens. The iris is normal and there are no evidences of intraocular inflammation. The fundus is normal, but the vision is reduced to 0.8 and cannot be improved. Under homatropin, the pupil dilates imperfectly, owing to the firm anterior adhesion. The cilium does not change position in movements of the iris or under cycloplegia.

The interesting phase of this case is the continued presence for nineteen years of a cilium in the anterior chamber without evidences of inflammation and without knowledge on the part of a fairly intelligent patient of a defect in his eye. Questioning of the family revealed the history of a perforating injury of the right eye (not the left, as the patient stated) by the blade of a pair of scissors nineteen years previously. At that time no oculist was consulted as the eye did not remain inflamed for any length of time.

AGRICULTURAL CONJUNCTIVITIS.

SANFORD R. GIFFORD, M.D.

OMAHA, NEBRASKA.

E. D. Taylor. Age 26. Reported by Dr. Gilmore of Red Oak. (Lived at Grant, not far from Manilla, Iowa, where the first patient we reported lived.) Seen Jan. 4, 1923. Gave the history that about one week ago the left eye became inflamed without any apparent cause. The last two nights it became painful and resembled a stye.

The patient was a farmer and had been working with horses and doing ordinary farm work. One of his horses had recently had distemper. The right eye was normal with a vision of 20/15; left eye vision 20/40. Lids swollen almost shut. Chemosis was very marked around the globe. There was a thin membrane on the lower lid and in one place on the bulbar conjunctiva, and also a round area of superficial necrosis on the upper lid, but otherwise the skin was not affected.

He was sent to the hospital with orders for boracic collyrium every four hours, 10% neosilvol every four hours, and heat four times a day. He was given intramuscular injection of five ccs. of boiled milk. The swelling subsided considerably in the next few days, so that the eye could be opened. No attempt was made to remove the membrane and it gradually disappeared. The skin lesion healed up without further necrosis. Jan. 10, 1923, condition markedly improved. Conjunctiva stained slightly with fluorescein in the lower fold and on the lid border. Patient discharged.

Smears of the membrane when first seen showed a profusion of gram positive bacilli. These were large and regular in shape with rounded ends. Some bacilli were apparently not pairs. The organisms were too large for the bacillus xerosis for the most part. Smears of the pustule on the skin showed many similar bacilli in groups around the dead epithelial cells. A few gram positive diplococci were present. Aerobic cultures of the membrane were negative. Agar showed colonies of staphylococcus and serum cultures from gram staphylococcus and a gram positive bacillus resembling bacillus xerosis. Smears and cultures repeated Jan. 9, 1922 gave the same result. Large gram positive bacilli were found in the smears, but only xerosis bacilli staphylococcus were found in cultures.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor, as read before the Society.

ROYAL SOCIETY OF MEDICINE, LONDON.

Section of Ophthalmology.

Friday, June 8, 1923.

MR. A. L. WHITEHEAD, President.

Macular and Cerebral Degenerations.

MR. H. M. JOSEPH showed a case of progressive macular changes associated with tremors. The patient was a woman aged 34. Two and one-half years ago she had tremor of the right hand, but no visual defect. When he saw her for the first time 2 years ago, there were light spots about both maculæ, and the corrected vision was 6/12. Since that date the spots had greatly increased in number. Vision had now fallen to 6/18, and the tremor was more marked and extensive. Wassermann was negative.

Discussion. DR. RAYNER D. BATTEN regarded the case as an adult instance of cerebromacular disease. Probably the same toxin might be at work, producing different symptoms at different age periods. Infantile, juvenile and senile types were now recognized, and the present case seemed to supply the missing link, the adult type. He entered into the reasons held for that view, and showed slides of various cases he knew of.

MR. F. A. JULER referred to a case under Mr. Leslie Paton, in a boy aged 18, which Mr. Paton diagnosed as cerebromacular degeneration, and said he regarded it as a connecting link between amaurotic family idiocy and later cases of cerebromacular degeneration.

DR. GORDON HOLMES said he was familiar with this tremor since the epidemic of lethargic encephalitis. He did not suggest that this patient's condition was a sequel to lethargic encephalitis, but he thought the area of brain affected agreed in the two conditions. The most important pathologic lesion in these cases was disease in the substantia nigra and in the neighborhood of the mesencephalic nuclei. It seemed to be a primary degeneration of certain portions of the grey matter of the brain.

THE PRESIDENT said that in the cases of encephalitis lethargica he saw, he had not noted any fundus changes, a curious fact if the basal ganglia were affected.

Familial Nodular and Reticular Keratitis.

MR. MONTAGUE HINE read a paper on this subject, based on three cases shown. This family, he said, helped to demonstrate a close connection between the two conditions; which did not appear so obvious when seeing individual cases. Mr. Basil Graves, who examined these three cases with the corneal microscope, aptly described the appearance as a "fine sheeny speckling", and suggested that the tissue might be impregnated with a fine translucent granular deposit, which might have a refractive index different from that of the cornea. Both eyes showed the same change.

The girl, aged 10, gave a history of slight headache, but no special intolerance of light. Right vision was 6/12, left 6/9. In her the opacity consisted of a number of fine lines, many of which were seen to be composed of tiny dots; but the lines here did not form a meshwork, but remained separated and uncrossed. One line suggested an obliterated vessel, resulting from previous inflammation. In the left cornea there was a combination of two of the linear opacities with several of the small rings, similar to those in her brother.

The mother, aged 36, said that her eyes had worried her since infancy; she had not had them examined before February last, when she came to be tested for glasses. R. vision was 6/18, left 6/12. The central area of the cor-

nea was seen to be studded with numerous, rather closely set greyish-white opacities; some in the form of rings, others nodular, while in places the nodules became confluent. The periphery of the cornea was clear in each eye.

The boy, aged 14, gave a history of severe headaches and intolerance of light since infancy. His cornea showed very similar changes to those seen in his mother. There was one child whose eyes were normal. In all the cases the Wassermann was negative, but the maternal grandfather was said to have had syphilis.

Discussion. MR. H. NEAME spoke of a case under Mr. Fisher's care, who had lines of opacity in one eye, and nodules in the other; the lines appeared to be about the middle of the substantia propria.

Tuberculous Conjunctivitis.

MR. R. L. REA showed a young woman, aged 23, with tuberculous conjunctivitis, in the form of ulcerative patches on the lids of both eyes. He had arranged for her to be sent to Leysin, in Switzerland, to have the direct sunlight treatment, from which he had seen there very good results. He hoped to show her again after she had received that treatment.

The Embryology of Congenital Crescents.

MISS IDA C. MANN read a paper on, "Some Suggestions on the Embryology of Congenital Crescents", which was supplemented by some excellent microphotographs and drawings shown by the epidiascope. The main thesis is as follows: The group of cases under consideration are charcterized by the fact that they are congenital, stationary, not necessarily associated with any one error of refraction, and situated, in 70% of the cases, below the disc. There is, apparently, some factor which determines the greater proportion of inferior crescents, which must be sought in the normal development of the disc, since an abnormality is more likely to be associated with a normally existing embryonic structure than it is to arise *de novo* as a pure aberrance.

The embryonic structure in this case is the choroidal fissure. The presence of congenital crescents in other situations does not detract from the fact that the choroidal fissure is the determining factor in the inferior type. The presence of the fissure will merely account for the preponderance of this type, since the essential condition for the formation of a crescent is that the pigmented outer layer of the optic cup should not reach quite up to the insertion of the optic stalk. The presence of the fissure merely allows of this occurring more easily below the disc than elsewhere. From the illustrations shown it can be seen that the essential difference from the normal consists of the failure of the pigment epithelium and nuclear layers of the retina to reach the edge of the optic disc in its lower part. Hence there is a small area below the disc in which all the elements of the retina except the nerve fiber layer are absent, so that this layer is separated from the sclerotic only by a very thin extension of the choroid.

Developmentally it has been shown that eversion of the unpigmented layer of the optic cup normally takes place in the upper end of the choroidal fissure. This is seen in a large number of vertebrates. In some animals, including man, the small everted portion of the inner layer loses its connection with the rest of the inner layer and disappears, but in some other types (birds) the connection is retained and nerve fibers grow into the everted projection. If in man the everted portion developed aberrantly and retained its connection with the inner layer, a condition resembling that normally present in birds might result. Such a condition is present in a congenital inferior crescent, which bears a striking resemblance to the structure of the lower part of the disc of the normal bird.

The occurrence of crescents other than inferior, i.e., the failure of the pigment to reach the edge of the disc in other situations, is comprehensible in the light of the work of the late George Coats, who showed that any one part of the optic cup may differentiate into tissues resembling that normally derived from another part.

The failure of the choroid and occasional thinning of the sclera in the crescent has its parallel in normal development. The mesoderm in contact with the outer layer of the optic cup differentiates into choroid, while that in contact with the inner layer—whether inside the cup or everted along the fissure—does not. The scleral condensation, in its turn, follows the developing choroid.

It may, therefore, be said that congenital crescents in any situation are due to the failure of the pigment epithelium to reach the site of implantation of the optic stalk. This failure may occur anywhere, since aberrant differentiation of the various parts of the secondary optic vesicle is known to occur. It is, however, much more likely to occur below the disc than elsewhere, since it is normal here at one stage of development in man. Hence the greater frequency of inferior crescents, which can be looked on as developmentally homologous with the cauda of birds, the architectural basis of the cauda being present, tho small, in the normal human embryo. The failure of the choroid is directly correlated with the absence of the pigmented epithelium, and the occasional failure of the sclera has its parallel in the retardation of condensation along the fissure during development.

THE PRESIDENT complimented Miss Mann on her exposition and the beauty of her slides.

Discussion. SIR WILLIAM LISTER argued that the inferior crescent was a retraction crescent, similar to the ordinary retraction crescent of myopia occurring at the macula.

SIR JOHN PARSONS agreed with Miss Mann's view, but in many cases the condition was associated with failure in closure of the choroidal fissure. With regard to the myopic socalled retraction crescent, a term he did not like, he thought this was probably an atypical coloboma, and that it had no relation to a stretching of the walls of the globe associated with myopia.

MISS MANN replied that the presence of staphyloma of the disc could also be explained as part of the retardation of the sclerotic condensation along the lines of the fissure. She agreed that myopic crescents also had a congenital explanation, tho in them some pathologic process was superimposed.

MR. P. DOYNE read a brief paper on the *Tournay Reaction* and it was discussed by MR. J. H. FISHER and MR. RAYNER BATTEN.

H. Dickinson.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

May 21, 1923.

DR. ROBERT VON DER HEYDT, President.

Cyst of the Iris.

DR. GEORGE S. DUNTLEY, Bushnell, Illinois, said that a patient came in three weeks previously, complaining of not being able to see well with the right eye. The history was, that when he was a baby 18 months old, he fell on a nail which penetrated the eyeball. He had no care other than that of a general practitioner, who said, "he had a black eye." He was accepted in service with a vision of 20/40. At the present time his vision was 20/100. The pupil was partially dilated and there was a scar on the iris. The pupil was slit like. There were two lobular cysts of the iris extending down on each side, partially obstructing the pupil. A portion of the lens was in the lower part of the pupil. The case had been seen by many ophthalmologists, and considered by some to be a foreign body, but Dr. Duntley believed it was a lobulated cyst.

Discussion. DR. GEORGE F. SUKER said he had seen the case in the morning, and by transillumination in a very dark room it proved to be a cyst of the iris. In the lower portion of each lobulated cyst there was debris, probably degenerated portions of the iris, with clear fluid above. He did not believe it was malignant. The reason it was lobulated was because the capsule in the upper portion had caught the iris. With transillumination, a red fundus reflex was seen clearly thruout both these cysts. The iris was thinned out or atrophied and depigmented. The patient had relatively fair vision.

The capsule was apparently intact. As to a foreign body being present, there was no evidence of siderosis. Undoubtedly, some conjunctival tissue would be found in the upper wall of the cyst, on the order of an inclusion cyst. The vitreous was not prolapsed into this cyst, as the posterior capsule was apparently intact.

DR. E. V. L. BROWN said it was interesting that an eye injured at the age of eighteen months had apparently gone on to the usual development of a normal eye. Many eyes that were injured in early childhood degenerated, and the patient had a much smaller eye than normal.

Influence of Oculomotor on Behavior of Pupil.

DR. GEORGE F. SUKER gave a detailed anatomic description of the pathways for the various pupillary reactions, illustrated by numerous charts. The sympathetic, sensory and motor nerve tracts for the pupillary reactions were schematically drawn. His remarks were an introduction to the papers of Drs. Cushman and Lifschutz.

DR. JACOB LIFSCHUTZ stated that the iris was under the influence of three nerves: 1. The oculomotor which innervated and controlled the sphincter. 2. The sympathetic which supplied the dilatator muscle and the blood vessels of the iris. 3. The trigeminus which supplied sensibility to the tissue of the iris.

The normal pupillary reflexes could be divided into four groups: 1. Those depending upon stimulation of the pupillomotor zone in the retina. 2. Those associated with the ocular movements. 3. Those resulting from stimulation of the sensorium of the body. 4. Those originating in the cortex.

A lesion destroying the pupillary fibers between the point of their separation from the optic tract and the sphincter nucleus would produce either a unilateral or bilateral Argyll Robertson pupil; i.e., the reaction of the pupil to light would be abolished, while the associated reactions to convergence and accommodation would remain unaffected. A similar condition would also result from a destruction of one or both sphincter nuclei, or of the fibers leaving the sphincter nucleus, before they joined the fibers from the accommodation center and became incorporated in the trunk of the third nerve.

In considering the disturbances of the consensual light reflex, it must be borne in mind that this reflex was dependent upon the integrity of the centripetal pathway in the illuminated eye, and the centrifugal fibers of the tested eye. This was due to the semidecussation of the pupillary fibers at the chiasm, and therefore the reflex might be absent in an otherwise perfectly normal eye.

One of the most important clinical pupillary entities, which deserved special consideration, where the condition of the pupil was a result of a third nerve lesion, was the socalled Argyll Robertson pupil. While this condition might be present in such cases as general paresis, cerebral lues or other cerebral diseases, multiple sclerosis, etc., it was so frequently associated with tabes, occurring in about 70-95 per cent of tabetics, that it was almost pathognomonic for this disease. In fact, neurologists considered the Argyll Robertson pupil as one of a triad of symptoms of tabes, the other two being incoordination and loss of knee jerks.

Tabes being a progressive disease, it was obvious that the loss of the light reflex was a symptom which might develop gradually, but when fully established, the condition was, as a rule, permanent. Hence, in our examination, one must not always look for a complete loss of light reflex, which probably occurred in the later stages of the disease. A derounded, irregular pupil, a relatively delayed, feeble or sluggish reaction to light, an incomplete and ill sustained miosis to strong illumination, or a perceptible difference in strength and time of pupillary reaction to accommodation and light—all possessed unmistakable significance, and should immediately arouse suspicion of a possible Argyll Robertson pupil and tabes. The diagnosis of the true condition of the pupils was also especially important, because very frequently, according to most authorities, the Argyll Robertson syndrome might precede the fully developed disease

for a long time, and often it was the first definite premonitory symptom of neurosyphilis.

As to the size or width of the Argyll Robertson pupil in tabes, it might be of average or normal size, miotic, or dilated, tho, as a rule, most tabetic pupils were contracted, often to a pin point. In those cases where there was a paralysis of the sympathetic with loss of the sensory reflex, in addition to a third nerve lesion, there was an absence of the dilatator impulse with a spinal miosis. If, however, the sympathetic was intact, the pupils would be dilated, usually unequally. In general, miosis was considered an early symptom, while mydriasis came on relatively late in the disease and was frequently associated with advanced optic nerve atrophy and blindness, with loss of reaction to accommodation and convergence, and with ophthalmoplegias.

As to the exact seat of the lesion producing the Argyll Robertson pupil, positive proof was wanting. So far as the nerve was concerned, the weight of evidence was that the lesion was between the anterior corpora quadrigemina and the sphincter nucleus. With reference to the sympathetic, the lesion might be in the fibers leaving the Gasserian ganglion for the pupil dilator, anterior to the place where the sympathetic fibers were given off to the ciliary ganglion. Or there might be no active lesion of the sympathetic at all. The spinal miosis would then be explained by the loss of the sensory reflex which usually occurred in tabes, and which was responsible for the absence of the stimulation of the sympathetic, and hence the latter did not exert its influence over the pupil, which remained contracted. It was hardly possible that the spinal miosis was due to a lesion of the sympathetic posterior to the Gasserian ganglion, for such a lesion would produce Horner's syndrome, which was not present in tabes.

Effect of the Sympathetic in Control of the Pupil and Pure Sympathetic Lesions.

DR. BEULAH CUSHMAN stated that the pupil dilatator fibers were of sympathetic origin. Physiologically, the autonomic or sympathetic system regulated all functions which were involuntary. They were capable of functioning automatically, yet were regulated and inhibited by central tonic impulses.

The superior cervical ganglion, which was the uppermost sympathetic ganglion in the neck, sent a branch upward. This branch divided, forming the carotid and cavernous plexuses. Parasympathetic fibers, which arose in the midbrain and medulla, also went to the ciliary ganglion (Sollman.)

Any sensory stimulus caused a dilatation of the pupil. To follow this arc, the stimulus passed along the centripetal or reciving fibers to the posterior columns of the cord and to the center, which was probably located in the medulla. From here, all the centrifugal fibers to the pupil passed by way of the Gasserian ganglion, with its sympathetic filaments, the ophthalmic branch and the long ciliary nerves to the dilator cells of the iris. The relation of the pure sympathetic fibers to the control of the pupil could be studied thru the effect of lesions and drugs.

Pure sympathetic lesions might be irritative or destructive. The irritative lesion caused a mydriasis to a varying degree, and a definite symptom complex. Spastic mydriasis might be differentiated from a paralytic, in which the third nerve was paralyzed, by the use of eserin, as eserin would cause a contraction of the pupil with the third nerve endings intact.

Irritative mydriasis was usually due to pressure from an enlarged thyroid, cervical glands, or an aneurysm. Apical tuberculosis with adhesions might cause an irritative mydriasis, and might go on to a paralysis of the cervical nerves involved.

The symptoms of the destructive, pure sympathetic lesions, had been described by Claude Bernard and Horner, and were called the Claude Bernard-Horner syndrome. The lesions were due usually to destruction of the superior cervical ganglion by trauma or pressure, such as stab wounds, burns, their scars and tumors.

Negro recently noted that the syndrome was a common stigma of degeneration.

A destructive lesion which involved one of the long ciliary nerves would cause a flattening of the pupil in that half, due to the loss of tone thru the dilator fibers, whereas with an irritative lesion, that portion of the pupil would be dilated.

The miosis in the Argyll Robertson pupil was probably due to a loss of the sensory reflex, involving the centripetal fibers, posterior columns or the preganglionic fibers. The diagnosis of a spastic mydriasis or miosis and a paralytic mydriasis or miosis had been studied in the pharmacologic as well as the physiologic laboratory, by the use of drugs. Nicotin paralyzes all ganglionic synapses of the sympathetic, as well as those of the parasympathetic. Cocain increased the peripheral excitability of the sympathetic system. Eserin counteracted cocain mydriasis and produced miosis by stimulating the third nerve endings. Epinephrin had a mydriatic effect under certain conditions in mammals, by producing a pure peripheral stimulation restricted exclusively to the sympathetic system. Atropin varied according to the dosage used; in usual amounts the peripheral fibers of the oculomotor were paralyzed and mydriasis occurred; with increased doses paralysis of the muscle of accommodation occurred, or cycloplegia. Dr. H. McGuigan stated that atropin was a paralyzing agent in the usual doses, but with larger doses produced some anesthesia.

Discussion. Dr. Julius Grinker said that ophthalmology and neurology met in various phases of practice. The circumstance that one was practicing either of these specialties did not make it certain that he always kept anatomic and physiologic details in mind. After one had been in practice many years he usually forgot theoretic details, while acquiring practical points in examination and treatment. It paid to occasionally go back to theory because it might be found that even theories might effect a change in practice.

The various theories advanced served as a working basis, and no one would think of discarding them any more than he would think of giving up the anatomic theory because of the absence of concrete proof. For instance, there were several theories to explain the Argyll Robertson pupil; it mattered little which was the true one. The really important fact was, that there was an Argyll Robertson pupil, and that it definitely meant certain things—almost always syphilis of the nervous system. He had seen it, however, in encephalitis lethargica and in other conditions, notably in chronic alcoholism. Whether the Argyll Robertson pupil was only a sign of syphilitic infection of the nervous system, or whether it was always a forerunner of tabes or general paresis, no one could tell. It was quite certain that Argyll Robertson pupils had been present for a period of ten to fifteen years, and then all of a sudden general paresis or tabes had developed. In such cases the Argyll Robertson pupil must be considered as the premonitory sign of parenchymatous neurosyphilis.

Dr. Harry Gradle asked Dr. Suker what was his opinion about the so-called pupillomotor area which Hess described some fifteen years ago. Did the fibers from the pupillomotor area run simultaneously with the light perceiving fibers or were they separate fibers? Judging from the anatomic chart, there were individual pupillomotor fibers from Hess' area on the retina, because of the branching from the optic tract to the third nucleus. That indicated very clearly a separation of the perceiving and motor fibers. In other words, if this chart was correct, there were two separate types of fibers from one area in the retina. That was still open to discussion. He said it stood to reason that there could only be one location for the lesion of Argyll Robertson pupil, that was between the geniculates and the third nucleus.

Dr. C. A. Burkholder said there were two or three points in the papers that ought to be very forcibly impressed on the audience. One was the terrific influence that the sympa-

thetic nervous system had upon all vital processes. Another important thing was the pupillary arc. The essayists mentioned it, but there was considerable difference in opinion among oculists as to its exact location. Ophthalmologists often said it went back of the cerebral cortex. This was not so. The light reflex arc never went behind the primary nuclei of the optic nerve. The preponderance of opinion was that this was the place where it was given off, and from there it ran down to the third nerve ganglion. It used to be called Meynert's bundle. What he wished to emphasize was that when one got a pupillary reaction from direct light, the lesion must be behind the primary nuclei of the optic nerve.

Another point he emphasized was the location of the ophthalmic ganglion. The ganglia associated with the fifth nerve were the Gasserian, the optic, the ophthalmic and the submaxillary ganglia. They derived fibers from the motor, from the sensory and from the sympathetic systems.

He said one of the drawings might be misleading; it gave the impression that the tract went directly back to the cerebral cortex, but in reality it did not. The same error was to be found in the textbooks.

Dr. Suker in closing, answered Dr. Gradle's question by saying that the retina was composed of two sets of fibers, light and motor fibers. He agreed with him regarding the opinion of Hess, that it was impossible to get any contraction from the extreme periphery. The pupillary fibers were not as intimately associated as were the sympathetics and the third nerve or the large vascular fibers. They intermingled but did not go into the anterior geniculate body.

He emphasized, as did Dr. Grinker, that the absence of the reaction to light on one side might be permanent for many years before it was present on the other side. It was reasonable that the inequality and irregularity in the Argyll Robertson pupil did not come on in both sides at the same time. The irregularity of the pupil was due to cicatricial changes in the motor and sensory impulses.

He was glad Dr. Burkhardt brought out the point about optic radiation. These arcs were given in all the textbooks. Optic radiation was in the internal capsule and did not go back to the cortex.

Clarence Loeb,
Corresponding Secretary.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

May 8, 1923.

Vossius Ring.

Dr. E. C. Ellett presented a patient showing a Vossius ring on the anterior capsule of the right eye. E. C., age 17, was hit in the left eye with a piece of mud the day before. Pupil dilated, blood in anterior chamber, abrasion of lower outer fourth of cornea. On the anterior capsule a Vossius ring, 3-4 mm. in diameter, was seen with the ophthalmoscope, but was scarcely visible with oblique illumination.

Dr. Ellett read notes of additional cases, as follows: Case 2. J. H. was seen three days after he had been hit in right eye with a pin. Eye red, blood in anterior chamber, pupil vertically oval. On anterior capsule a ring 3-4 mm. in diameter (Vossius ring) faintly seen by oblique illumination.

Case 3. T. F. T. Seen Nov. 29, 1922. Two days before he was struck in right eye by a piece of wood. Wound at limbus down and in, with iris prolapse. Ophthalmoscopic examination negative except slight clouding of lens. Excised prolapse and dressed pillars back.

Dec. 7, 1922 Vossius ring seen on anterior capsule with +16. Ring complete, 4 mm. in diameter. Not seen by oblique illumination.

Case 4. W. W., age 16, seen January 1922. Was struck in the left eye that day with a stick. There was blood in the anterior chamber, and vision was 20/100. When this cleared up there was a whitish opacity seen in the retina (Berlin's opacity), and on January 25th, the anterior chamber had cleared so that a Vossius ring could be seen on the lens capsule with a +16. January 30th, ring scarcely

visible, vision 20/30. February 3rd, 20/20.

In all of these cases the ring completely disappeared, as it generally does.

Vossius originally described this lesion as an annular opacity about 3 mm. in diameter. It is seen thru the dilated pupil on the anterior capsule after contusions of the eyeball. Vossius believed the opacity to be due to sudden and violent pressure of the pupillary margin against the iris by the cornea; the brown color, where present, resulting from iris pigment being left on the lens; while the other opacities were the result of degenerative changes in the capsular epithelium, analogous to the experimental contusion cataract described by Schirmer (which also disappeared completely).

Hoeg's conclusion is that in place of the ring being produced by the cornea being pressed back against the iris and lens, it is simply the sudden elevation of the pressure in the anterior chamber which presses the iris against the lens with sufficient force to produce the ring.

Paralysis of Sixth Nerve with Mastoiditis.

Dr. D. H. Anthony reported this case. Mrs. G. P., age 19, well developed white woman, was seen January 11th, 1923 with the following history: About five years ago had one attack of discharge from both ears for a few days, which got well. Four weeks previous to the first time I saw her, she contracted an acute rhinitis, associated with sore throat. One week later severe pain occurred in right ear; which existed for 24 hours, when the right ear began to discharge bloody, thin purulent secretion in profuse amount, with absence of right earache. At the end of 48 hours the character of the discharge changed to thick, yellow, purulent secretion in medium amount.

About five days following, which was about 15 days from onset of illness, severe pain began in the region of the right frontal, parietal, temporal and same side of neck. This pain in a few days became very much worse and continuous, and could be relieved only by opiates. At this time a free myringotomy was done by the physician who referred this case. This procedure did not stop the severe pain in the right side of head and neck, which continued until the fifth week from onset; when patient awoke one morning and noticed that she was seeing double, and the right eye was turned slightly in. This double vision could be avoided only by closing one eye or turning the head to the extreme left, in which position the right external rectus would not be called on to function.

On examination left ear was negative. Right ear showed marked tenderness on slight pressure over region of mastoid antrum. The external auditory canal was filled with thick, yellow, purulent secretion. Drum was red with marked bulging. There was a small perforation in center of posterior half. Nose showed marked deflected septum to the right—good airway in middle meatus. Throat showed pharynx very acutely congested, tonsils medium size, red, and crypts clean. Both eyes showed vision to be 20/20. All other examinations were negative, except that the right eye showed a medium convergent squint with limited movement to the median line, with homonymous diplopia upon movement to the right, with two images on a level. Blood Wassermann was negative.

The X-ray showed necrosis of the mastoid cells, involving the region of the right mastoid antrum and the adjacent cells extending downward in the tip.

Treatment: Jan. 11th. Free myringotomy right drum and suction applied to the canal several times next day. On the evening of the 12th day, a mastoidectomy under ether, making a long, very posterior incision, opened mastoid. Antrum, mastoid and adjacent cells for some distance were completely necrosed and contained granulation tissue. No dura or lateral sinus exposed. At end of the seventh day patient returned home for further dressing to be carried out by home physician. There had been no change in the eye symptoms. The severe headaches on the right side disappeared 48 hours

after the operation and patient has had no pains since.

On Feb. 15: Posterior mastoid wound and drum healed, movement of right eye could be extended beyond the median line. Diplopia occurred on movement of eyes to the right.

Sarcoma of Choroid.

Dr. D. H. Anthony reported this case. Name: Mrs. E. L. Redman. Res: Millington, Tenn. Age 78 years. History: Poor vision began in left eye March, 1922. Severe pain began in April, 1922, which has been severe and continuous until Sept. 15, 1922, when left globe ruptured spontaneously. Left eye blind for four months. External examination of O. S. shows rupture in center of cornea, eye was filled with large blood clot. O. D. had mature senile cataract. Enucleation of left globe on Sept. 15, 1922.

Pathologic findings by Dr. F. Verhoeff. Melanotic spindle cell sarcoma of choroid. Intraocular hemorrhage from tumor. Necrosis and purulent infiltration of cornea. Rupture of cornea near limbus. The main tumor extends from the posterior part of the ciliary body to within 1 cm. of the optic nerve, and continues as a simple invasion of the choroid to within 4 mm. of the optic nerve. In the section, the tumor measures 10x15 mm. It contains unusually large and numerous blood spaces, some of which, near the surface, have ruptured and caused the intraocular hemorrhage. The retina is completely separated. The sclera in the section has been slightly invaded but nowhere perforated by the tumor. The optic nerve has not been invaded.

The patient died with pneumonia three months after the operation.

Glaucoma, Trephining.

Dr. J. B. Blue reported this case. H. W., age 26. O. D. lost by injury at the age of eight years. Says sight in O. S. began to fail in December and is now fingers at about 20 feet. The first symptom was failing vision, no pain except slight headache. Tension 70 mm. before operation. Wassermann and other tests negative. Sclerocorneal trephining. Tension 20 mm. when last taken. Tension in O. S. has been reduced since operation on O. D.

Retinitis Proliferans.

Dr. M. B. Seligstein reported as follows: S. F., colored, age 35, occupation oiler, was seen at the out patient Department of the University July 15th, 1922. His chief complaint was that he was struck in the left eye with a fist, one year previous; and that his vision has been getting worse. He says his right eye has been bad for the past eight or nine years. He also states that a floating shadow seems to pass over the right eye at times.

Vision, R. fingers at eight feet. L. 20/200.

External examination: Right eye, normal except for dilated pupil, left normal.

Fundus examination: Right eye, vitreous opacities numerous. Covering the disc in an indistinct mass, and extending from this mass downward, upward and in all directions are whitish streaks. In the extreme lower periphery of the fundus, several of these whitish streaks terminate in a pear shaped patch of pigment. Left eye shows an exudation on the temporal side of the macula similar to that in the right eye. In the lower periphery of the field there is a detachment of the retina. With correction, vision of the left eye is improved to 15/70. The right is unimproved.

Conical Cornea.

Dr. Ellett reported three cases, and asked opinions as to the best method of treatment.

Case 1. W. B., age 18. Seen March, 1922, with complaint of poor vision for six months. O.D. 20/100 and J.10. O.S. 20/70 and J.4. The whole trouble is in the cornea, the eyes being otherwise normal. The targets of the ophthalmometer show images elongated away from the corneal center, the images are small, and the astigmatism is more than the instrument will measure, which is about 10 D. Under cyclopegia, refraction was +3.00 with +7 cyl. axis 180° each eye, and with the pupils down, +3 cyl. axis 180° gave the best vision, about 20/40. Treatment, pilocarpin and a pressure bandage at night. After a year the vision is about the same without glasses, and

glasses do not improve it. The question is as to what form of operative treatment to advise, since the vision is getting worse under the medical treatment.

CASE 2. Mr. A. R. was seen in 1905, being then 25 years old. The vision in the right eye had been failing for 4 years. The vision was fingers at four feet, not improved by glasses. The trouble was all in the cornea, which presented the usual appearance of conical cornea. About 1908 an iridectomy was done on this eye by another physician. In 1921, the vision in the right eye was perception of moving objects. The left eye has normal vision with glasses. The correction in 1905 was +2 cyl. axis 180°, and in 1919 under cyclopegia it was −1.○−2.5 cyl. axis 165°.

CASE 3. P. K. was seen in 1915, age then 35. Vision right eye, 4/200 unimproved by glasses. Left eye 15/200, −2.00 cyl. axis 155°, 20/100. Conical cornea in both eyes, worse in the right. Right cornea was cauterized, with some temporary improvement of the vision. At one time he saw about 20/200. The last time he was tested, in 1916, his vision was again 4/200 in the right eye, and 15/30, with glasses, in the left.

Iridodialysis with Complete Recovery.

DR. A. C. LEWIS reported. Mr. J. L. G. was first seen on April 26th, 1923, one hour after being struck in left eye with a piece of babbitt metal. The eye showed a small conjunctival laceration on the nasal side near the limbus. The anterior chamber contained a small amount of blood; the iris was torn from its peripheral attachment for a distance of fully one cm.; the pupil was irregularly oval and displaced down and out; media were cloudy and only light perception remained.

Atropin, dionin, neosilvol and an eye patch have been used since. The iridodialysis disappeared, the pupil regained its normal shape and position on the 8th day. The media are now almost clear and the vision 20/60. This reduction in vision is probably partly due to an inflammation in the optic nerve as shown by the congestion of the disc.

Chronic Optic Atrophy of Unknown Cause.

DR. LEWIS reported: Mr. F., age 68, was first seen yesterday (May 7, 1923) with a history of dimness of vision for 25 years. No pain or inflammation in the eyes at any time. Has always been strong and vigorous, never used alcoholics and not much tobacco, nor had any venereal disease or any bad spell of sickness. During the month of Nov., 25 years ago, while in good health, his vision, which had always been perfect, almost disappeared. The eyes were not inflamed or painful at any time.

Examination shows vision in O.U. equals moving objects at 12 feet in good light. Tension normal, pupils react slightly to strong light. Ophthalmoscopy shows moderate atrophic changes in the nerveheads and narrowing of the retinal arteries; otherwise negative. Blood Wassermann reported negative.

THE OPHTHALMOLOGISTS OF EASTERN SOUTH AMERICA.

JAMES M. PATTON, M.D.

OMAHA, NEB.

This is a special report of the observations made by one who accompanied the party arranged by the American College of Surgeons which visited South America early in the present year. It includes the impressions collected regarding ophthalmology and ophthalmologists in that part of the world.

That the oculists of South America are unexcelled as hosts, or as scientific clinicians, was thoroly demonstrated to those so fortunate as to be members of the recent cruise of the American College of Surgeons, who visited the hospitals and clinics of the southern Republics.

At Havana we were met by Professor Finlay and Dr. Fernandez of the

department of ophthalmology, and by Professor Martinez, Dean of the medical department of the University of Cuba and head of the department of oto-laryngology. Our stay was too brief to admit of a clinical program, but these gentlemen and their associates did everything to make our visit a most delightful one. A similar welcome awaited us at Panama, Cartagena, and Caracas, and we truly regretted that our itinerary did not allow time for clinical demonstrations at these cities.

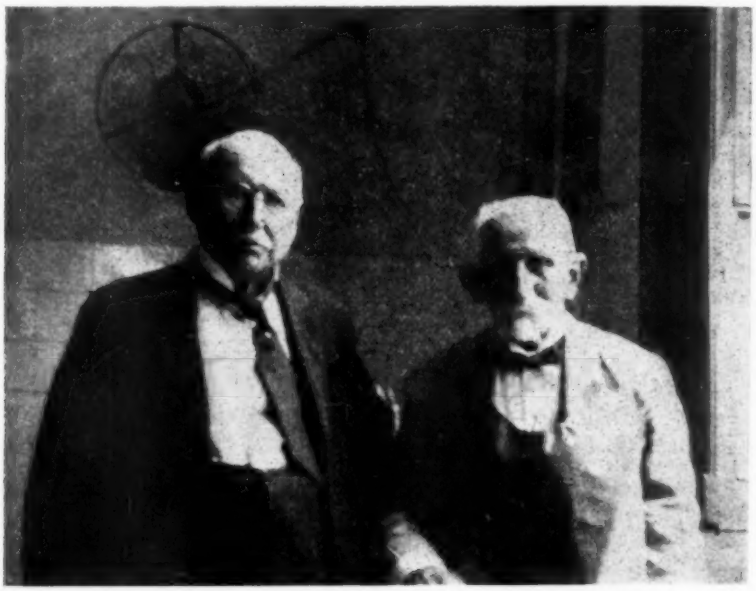

Fig. 1. Right, Prof. Brazil, Chief of Ophthalmological Department, Policlinic, Rio de Janeiro, Brazil.

During our visit at Rio de Janerio, Prof. Abrew Fialho of the department of ophthalmology was out of the city, but his assistants were very courteous and showed us thru the operating rooms and wards devoted to ophthalmology at the Santa Casa de Misericordia Hospital. The rooms devoted to refraction and ophthalmology are well arranged and equipped for satisfactory work. The operating rooms had high ceilings and were well lighted, with satisfactory modern equipment. The wards were large and conducted along the lines of the continental hospitals of Europe. Several interesting cases of uveitis were demonstrated and were apparently being treated in a thoroly scientific manner.

Dr. Moura Brazil, (Fig. 1), for many years chief of the department of ophthalmology at the Policlinic, was conducting a large and very interesting out patient clinic on the morning of our visit. He demonstrated several postoperative cataract cases, all simple extractions, and free from irritation. The pupils were round and apparently without adhesions. As the cases had not as yet been corrected, we were unable to learn the visual outcome, but clinically, they were all that could be desired. The doctor presented some forty or fifty cases of trachoma, which he was treating with local application of liquor hydrargyri nitrat in 1-300 aqueous solution. He did not use any operative treatment and stated that he was able to get satisfactory results in a few weeks. The cases did not show as much corneal irritation as we expect to see in our trachoma cases in North America. Several cases of Neisserian ophthalmia were shown in which the corneas were badly damaged, but the Doctor explained that these cases very rarely came for treatment until the corneas

were more or less necrotic. Cases of uveitis, corneal ulcers, etc., were apparently being treated according to the latest accepted methods.

A splendid ear, nose, and throat clinic was given by Professor Marinho, head of the department of oto-laryngology, and his associates, to the visiting oto-laryngologists at the San Francisco Hospital, followed by a moving picture demonstration of various operative technics in the projection theater of the Policlinic. He showed a number of very extensive resections for malignant growths in and about the orbit and maxillary sinuses.

Our time did not permit of further clinics, but we were certainly indebted to our Brazilian colleagues for their courtesy and hospitality.

Dr. Raul Argañaraz represented the oculists of Buenos Aires on the reception committee that boarded the Van Dyke as soon as it was made fast to the dock. Dr. Argañaraz is a worthy representative of the many splendid men who are practicing ophthalmology in the great metropolis of the southern hemisphere. Traveler, linguist, and author, he has a charm of personality that assured us of a hearty welcome. We found the Doctor to be an enthusiastic research man, as well as a skillful clinical operator; his courtesy and hospitality adding greatly to the delights of our visit.

Fig. 2. Dr. Argañaraz (center) and associates, Ophthalmological Department, Clinical Hospital, Buenos Aires. Bust of Prof. Pedro Lagleyze.

Thru the courtesy of Dr. Arce, dean of the Medical department of the University of Buenos Aires, Dr. Argañaraz and his associates, we visited the eye department of the Clinical Hospital, a large institution directly across the street from the Medical College, and devoted exclusively to the treatment of patients suitable for teaching purposes. The ophthalmologic department is well housed in a large wing of the hospital, with every modern facility for demonstrating and teaching clinical and research work. (Fig. 2) Several interesting operations were presented by Drs. Argañaraz and Tiscornia, after which we were taken thru the laboratory and many interesting specimens demonstrated, notably an ecchinococcus cyst in the vitreous, a most unusual condition.

The following morning, we were the

guests of Dr. Oyenard and staff (Fig. 3) at the Ophthalmic Hospital. This is a new building of 150 beds, completed at a cost of $800,000, and is the last word in modern ophthalmic hospitalization. Three high stories built about an open patio gives ample ventilation to the large comfortable wards.

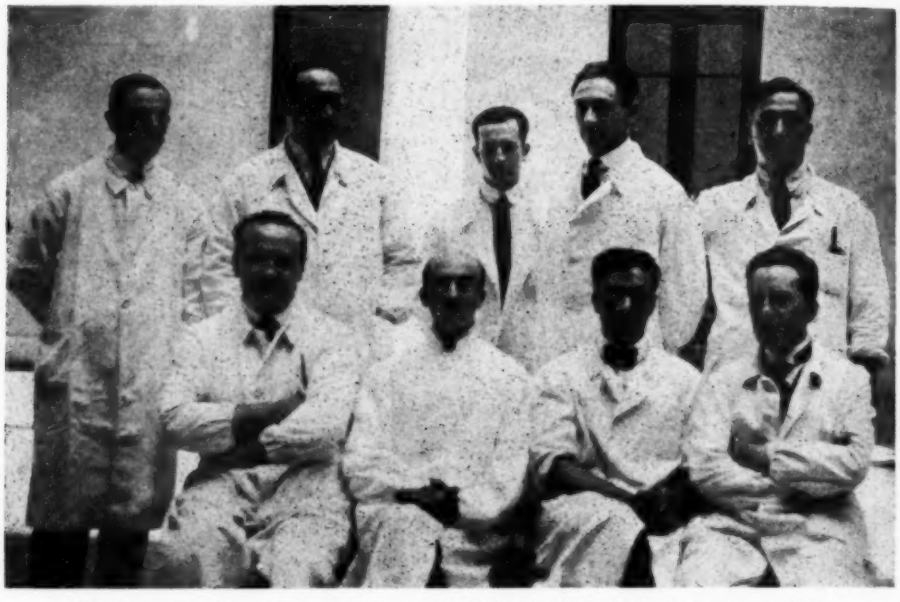

Fig. III. Dr. Oyenard (center) and staff, Ophthalmological Hospital, Buenos Aires.

The executive offices and out patient department are located on the first floor. A suite of four excellent operating rooms with good south light were on one side of the second floor. The other three sides and the third floor were devoted to wards, kitchens, a small dining room on each floor for walking patients, baths, etc. A large automatic elevator facilitates the transfer of patients from floor to floor.

Dr. Oyenard and Dr. Moraschi did a number of operations in a thoroly satisfactory manner. Dr. Oyenard is a most dexterous operator and a thoro master of technic. He later showed an interesting group of postoperative cases. He prefers the simple extraction in the management of cataracts, and a number of recent cases with round pupils and little if any reaction were clinical evidences of his skill. However, he does not hesitate to do the combined operation if conditions warrant it.

In the management of glaucoma, he prefers the technic of Elliot in the chronic cases, employing the broad iridectomy in the acute. He told us that there was comparatively little trachoma in Buenos Aires, limited to recent immigrants. However, there is no law controlling this condition, and in some of the provinces as high as 80% of the people have this trouble. Powerful ring or inner pole magnets were installed at both the clinical and ophthalmic hospitals, and were apparently giving excellent results.

It was interesting to observe the constructive influence, still very evident, of the late Professor Pedro Lagleyze, dean of Argentine Ophthalmology. He was quoted repeatedly, and it was gratifying to see the younger men anxious to honor the man who had done so much in our special field.

As our stay in Montevideo was to be short, no special arrangement had been made for ophthalmologic clinics, so we took the liberty of calling on Professor Isola, chief of the depart ment of ophthalmology of the Uni-

versity of Uruguay at his private office. He was exceedingly gracious and invited up to attend a clinic in the Maciel Hospital the following morning. This hospital, built in 1825, is distinctly European in type, built about several open courts and lacking in many of the modern conveniences. However, a large wing is devoted to the eye, ear, nose, and throat department. Professor Isola (Fig. 4) and associates conduct an extensive out patient department and research work in addition to their operative service. The Professor presented several interesting operations, including an extraction and optical iridectomy, later demonstrating fundus work as studied by red free light. In spite of the rather antiquated housing, the department is equipped with modern appliances and the staff is doing excellent research work. Professor Isola kindly discussed his cases at length. He is apparently much interested in the foreign protein treatment of ocular inflammations. He had been using "blister serum," but lately has been using "aolin," first testing the reaction of the patient by small cutaneous injection. He impressed us as being an excellent teacher, and undoubtedly is an inspiration to the students who came under his care.

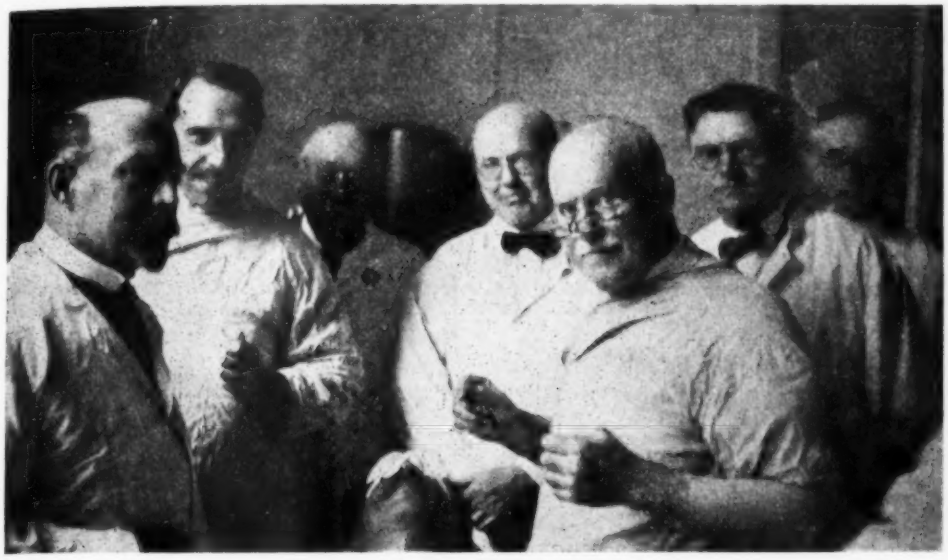

Fig. IV. Dr. Isola (right), Professor of Ophthalmology, University of Uruguay.

The oculists we had the pleasure of meeting thruout our trip impressed us as being men of broad culture, familiar thru frequent visits with the leading special clinics of Europe and America, and a review of our indexes shows them to be frequent contributors to the current scientific literature. Thruout our trip, we were treated with the greatest courtesy, and we sincerely hope we may have the pleasure of frequent visits from these gentlemen.

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MERCURY IN OCULAR THERAPEUTICS.

Ranking for five hundred years as one of the most important drugs known to medicine, the established preeminence of mercury in the treatment of syphilis and its sequels and later as a bactericide antiseptic, have overshadowed its achievements in other fields of therapeutics, and caused its relative neglect in the treatment of very important conditions. Until the improved microscope gave an insight into cell life, the action of mercury in various diseases strongly influenced the views held with reference to their pathology; and when these views were found inaccurate or erroneous, the drug, whose effects had been linked up with them in current speculations, suffered in reputation by this connection.

The influence of mercury on inflammations of the uveal tract was one of the definite facts around which the older pathology of inflammation was built. When this collection of influences and speculations, held as a theory of inflammation, showed its crudity and error, even the foundation facts fell under grave suspicion. It was so simple to credit all the cures by mercury to unrecognized syphilis, that the "therapeutic test" became a favorite means of diagnosis. The fallacies that syphilis is one of the most common diseases and that all pathologic changes in syphilitics are caused by syphilis, are so generally accepted, that it is startling to meet the facts shown in the statistics of the examination of men for military service in Great Britain, during the last year of the world war.

These show, that among 77,900 men found unfit to enter active military service, the disabilities caused by syphilis amounted to only 0.3 per cent, while hemorrhoids disabled 0.7, deafness 1.0, defective vision 1.6, tuberculosis 3.1 and heart diseases 10.0 per cent. The supposition that because a condition was benefited by mercury, it was therefore due to syphilis, is widely at variance with the facts, and has served to hide and confuse the etiology of whole classes of most important lesions. In the light of these latest, most broadly based and probably accurate statistics, regarding the share of syphilis in the general morbidity of the community, and with the light we now have on the nature and importance of "focal infections," the

assumption that syphilis is the cause of everything cured by mercury is absurd.

It is not questioned that syphilis is a common disease, and in some races, localities and social conditions it may be the most common; and mercury is the most important drug in the treatment of it. The treponema pallida seems able to develop a tolerance, or even immunity, toward the arsenical preparations, but not toward mercury. The majority of syphilitic lesions affecting the eye are chronic. Hence, for such lesions mercury is the most reliable drug, for use in the prolonged treatment required. Lesions of the central nervous system that affect sight, late chorioretinitis and parenchymatous keratitis yield slowly, but their progress is more surely checked by mercury than by any other drug. Degenerated nerve tissue and scarred corneas are not restored to normal by it, but prolonged mercurial treatment may greatly limit the damage.

But it is in the treatment of lesions of the eyes not due to syphilis that mercury has been most neglected, and most commonly forgotten. For focal infections, the prompt removal of the infecting focus is the obviously rational procedure. But before this is accomplished the infection has occurred and secondary foci, often undiscovered, may have arisen elsewhere in the body. These require treatment and may require treatment over long periods. In their treatment mercury is the most generally useful drug. Other drugs like the salicylates, quinin, iron and arsenic may be of value, but mercury is more generally effective, altho its best effects may only appear after prolonged use.

Despite the mystery and confusion that have been thrown around it by speculative hypotheses, there is a pathologic condition of wide importance and common occurrence among those leading sedentary lives, referred to as autointoxication, or gastrointestinal intoxication. In the eye it furnishes the basis of chronic disease of the uveal and corneoscleral coats, and may have some share in the degenerations that are thought of as senile. It is very closely associated with the focal infections. The two seem to aid each other. In both, toxemia is an important factor. The same class of ocular lesions arise from both. And whether or not all the sources of focal infection can be found and removed, whether or not the patient's habits of living can be so changed as to prevent gastrointestinal toxemia, treatment with mercury is indicated and should sometimes be kept up, or returned to over as long periods as for the treatment of syphilis.

Sympathetic ophthalmitis includes causative factors and lesions that relate it to the focal infections, and may also require prolonged treatment. In this treatment the writer would place mercury as more important than any other drug. The salicylates may be used first and in massive doses, later arsenicals and iodids may be useful; but in the writer's experience mercury has been most clearly and most generally of service.

The methods of giving mercury have varied from time to time under the influence of medical leaders and fashions; but it seems clear that in all methods of mercurial treatment the introduction of this chemical element into the body in some form is the essential. For uveitis, including chronic or recurring iritis, and especially in the treatment of gastrointestinal toxemia, calomel in small doses, just short of decided effect on the bowels, kept up for many weeks or months, offers decided advantages over other methods.

Dangers of idiosyncrasy to mercury and the disastrous effects of excessive doses must not be overlooked. But the mistake of neglecting mercury is more common than that of giving too much. E. J.

SUICIDE AFTER CATARACT EXTRACTION.

We see by the papers that another hospital patient has committed suicide! Temporary insanity is not infrequent after surgical operations, especially

those upon the head and eyes, and in the latter more common in cataract patients. While there is generally a background of alcoholism and somatic diseases, or in some cases the mania may be due to the systemic effects of atropin, yet the main reason for the mental disturbances is the close confinement of the patients having both eyes bandaged for a number of days. They lie on their backs thinking of their past life and future prospects; and unless encouraged by the physicians and nurses to think that they will see again, discontent and melancholia supervene, followed in an occaional case by attempts at self destruction.

The writer learned many years ago that it was absolutely necessary to give such patients close attention with night and day nurses, not only for this reason, but likewise to forestall any attempts at removal of bandages and rubbing the eyes. During the period of close confinement, stimulants such as tea and coffee are interdicted and mental suggestion is used to keep the patient quiet. The nurse is instructed to be cheerful and not to permit the patient to become morbid, and the patient is encouraged to think of pleasant things, particularly of what he is going to do when he recovers his sight. By these means the writer believes that in the last years of his practice he has had fewer cases of mania, and none of self destruction, altho, until he learned of the foregoing procedures, he had a number of unpleasant experiences.

H. V. W.

INTERNATIONAL CONGRESS.

There is every reason to believe that the decision to postpone, without fixing any date, the International Congress of Ophthalmology that was to be held in London in 1925, is commendable. The committee reaching the decision had given most serious study and conscientious thought to the situation. It was influenced by the sincere desire to make the best of a very difficult situation; and no good could be accomplished by trying to bring together those whose meeting would only intensify bitterness and animosity.

Nevertheless, the need for such postponement, the raising of the issue that leads to it, the existence of the feeling that made it seem necessary and the result brought about, will be deeply regretted by a large body of ophthalmologists scattered thru many countries; who looked forward to the London Congress as an opportunity to advance ophthalmology, make and renew pleasant personal acquaintances, and emphasize the rightful supremacy of scientific truth over racial feeling and local or temporary interests.

International congresses are carried on by those who are dominated by a broad interest in science or humanity, rather than by national interest or racial feeling, or the expediencies of international politics. For a long time, it will be a fact that some will support and attend and profit by such gatherings; and others will see reasons for avoiding and opposing them. Both sides will believe themselves right and magnify the reasons that have decided their course. But the future of science, the development of knowledge, the growth of international cooperation and good feeling depend on the growth of international institutions, of which the scientific congress is one of the most important.

It would be foolish to ignore the international situation that exists today; or to attempt what, in view of that situation, is now impossible. But it would be even more foolish not to do what we can because something we hoped to accomplish is not to be done at present. The desire for international cooperation, the development of such means as are practical toward that end, the holding of such meetings as can be held, the extending of such invitations as can be based on honest desire for communion, must not be neglected for an instant. The welcome and the hearing that have been given of late years to visitors and teachers from other countries, even some from the late "enemy countries," and the

interest in the literature of science, whatever the country or the language in which it is given forth, are hopeful signs.

The world congress of ophthalmology is still a dream and may remain a dream for many years to come. It has never been compassed in any of the international congresses yet held; and the obstacles of race feeling and language will long stand in the way of its consummation. But in the field of literature, of impersonal thought, greater advances have been made; and international congresses along slightly different lines are still possible.

It would be possible for the ophthalmologists of some country, neutral in the world war, to extend an invitation to the ophthalmologists of all countries, to attend a congress at which such languages as would best serve the needs of the occasion could be made official, without raising the complaint that others were being "boycotted"; and where resolutions not to attend, because certain other former enemies were invited, could not produce the disturbing effect they have when addressed to former allies and against former common enemies.

But during the interval when an international congress along the old lines seemes impractical, an international congress of a different type might be developed—the international congress of a single language might be utilized. A congress attended by English speaking ophthalmologists from all parts of the world; not only from the group of nations that form the British Empire and from the United States of America and its dependencies, but those of other nations who read and speak English, would be strictly an "international congress." Germany in Der deutschen ophthalmologischen Gessellschaft, the socalled Heidelberg Congress, and France in the Société Française d'Ophtalmologie have organizations that have really held one language meetings. The Congresso Hispano-Americano Oftalmologia might well be put on a more frankly international basis; and could, with great advantage to itself and to Ophthalmology, hold every second or third meeting in America. In South America there is a group of Spanish speaking nations that have reached a stage of development in medical science that should be thus recognized. Joined by Cuba and Mexico, they would give a strong Spanish speaking congress. The immediate future should be utilized for such an undertaking.

Still another type of international congress of ophthalmology that has not been generally tried is that of a meeting for one of the great divisions of the earth. A Pan-American Congress of Ophthalmology could be held, without waiting for Europe to forget its jealousies and hatreds. Similar gatherings might be held in Eastern Asia, in South Africa, Australia or on the shores of the Mediterranean. Indeed, what have been known as the international congresses of ophthalmology, with the exception of the Washington Congress and the little meeting in New York in 1876, have been such local international congresses of Europe. The world congress of ophthalmology is still to come. Its coming will be hastened by the holding of such international congresses as have been indicated, which are possible at the present time.

E. J.

OPHTHALMIC EXAMINATIONS.

The American Board for Ophthalmic Examinations will hold its next examination in Baltimore, October 15th. There will be a practical examination at 9:30 a. m., at the Presbyterian Eye and Ear Hospital, 1017 East Baltimore street, and a written examination at 3 p. m., at the Medical and Chirurgical Faculty Building 1211 Cathedral street, Baltimore.

BOOK NOTICES.

The Operative Treatment of Glaucoma. H. Herbert, F.R.C.S. Eng., Lt. Col. Indian Medical Service Retd. Pathologist to the Sussex Eye Hospital. Cloth, 160 pages, 31 illustrations. New York, William Wood & Co.

The contributions of India to ophthalmology have been very important during the last generation, and still others are coming into the literature. Well educated British surgeons, with a keen interest in the practical side of ophthalmic surgery, found there new conditions, new requirements and abundant clinical material for the practice and development of new operative procedures. This was especially true with regard to glaucoma, of which many cases were encountered, usually in an advanced or even hopeless stage. As Herbert puts it: "Indian patients were extremely loth to submit to operation on their eyes for any affection except cataract, as long as any sight remained."

In such cases the classic operative resource, iridectomy, was very often disappointing. There was encountered "an extraordinary percentage of immediate and early complications, many of them disastrous." Practical surgeons turned to methods of subconjunctival drainage, and trephining of the sclerocorneal limbus rapidly rose into great importance.

"The immediate occasion for the writing of this monograph is, in part, the decline of trephining and its consequences. The worst of these consequences is the (temporary) rejection of some surgeons, more particularly in German speaking countries, of all recent surgical work on the treatment of glaucoma, and a return to the most unsatisfactory position of the last century. The earlier portion of the continuous glaucoma "movement" of the present century was essentially a revolt against the inefficiency of iridectomy; the revolt is now against the conjunctival bleb, as result of fistulization."

This book is divided into five chapters: I, Preliminary, 35 pages, from which the above quotations are taken. II, General Principles, 49 pages. III, Practical Application, 31 pages. IV, Technique, 19 pages. V, After Treatment and Complications, 14 pages. In the first chapter, practical division of primary glaucomas and the indications for and justifications of operation are of especial interest. In the second, there is a wide range of discussion of various operative methods, their results, modifications, dangers, etc. The conclusions reached are: That the advantages gained by iris inclusion in the operative wound are real; that it may be the only way of obtaining wide filtration; that fears of it have been proved groundless. "It may even be maintained with some show of reason that the opponents and advocates of iris-inclusion have unconsciously been working in different ways to the same end—viz.: the determination and attainment of the unobjectionable forms of iris-impaction."

In the chapter headed Practical Applications are considered, with trephining, the author's wedge isolation operation, small flap sclerectomy, the surgical treatment of buphthalmos and the iris inclusion operations. In regard to the last named: "Caution is enforced by the fact that recorded results of iris-inclusion methods have generally shown a definite percentage of failures to relieve tension, not confined to absolute glaucomas. In the author's experience of recurrence of abnormal pressure, whether transient or persistent, the blockage, so far as one could judge, was not generally in the sclerocorneal wound; it was in the subconjunctival loop or sac."

In the nineteen pages of technic, no attempt has been made to reproduce or even summarize the vast literature relating to this aspect of glaucoma operations. Some acquaintance with this literature is assumed, and the technical details that seem important from the author's point of view are set down to supplement the generally adopted operative routine. In the account of after treatment, the place of atropin and the use of intermittent pressure (massage) are defined. The

complications, briefly noticed, are the loss of field following operative interference, delayed reforming of the anterior chamber, iritis, late infection, hyphemia, blood staining of the cornea and cataract.

This book puts forward no claims for the original contributions of its author in this field; but every paragraph gives the individual views of a thoughtful and experienced operator, who has considered every procedure suggested of late years for the relief of glaucoma. Taken as a complete treatise on the operative treatment of glaucoma, it fails to do justice to the most important operations, iridectomy and sclerocorneal trephining. But taken as a contribution to this subject, it may well be carefully read by anyone who undertakes to operate for glaucoma, and will be found rich in valuable suggestions.

E. J.

The Operative Treatment of Glaucoma. By **H. Herbert,** F.R.C.S. Eng. Lieut.-Col. I. M. S., Retd. London, Baillière, Tindall & Cox, 1923.

The appearance of a book on the operative treatment of glaucoma by one who has deservedly made an international reputation as a result of his work in connection with this disease, is bound to be welcomed by ophthalmic surgeons thruout the world. The title given to the work is perhaps somewhat misleading, for it cannot be said to be in the broadest sense of the word a discussion of the operative treatment of glaucoma. It is rather a description of the various operative procedures, with and without the deliberate inclusion of iris, which the author has from time to time brought before the profession, and an exposition of his views on the ideals towards which we should all be moving in our surgical treatment of glaucoma.

Colonel Herbert is assured of a wide and sympathetic circle of readers, for everyone recognizes the earnest study, and the whole hearted honesty of purpose which he has brought to bear on his subject. It is therefore all the more to be regretted that his meaning is not always easy to follow, and that his diagrams are sometimes too sketchy to be really helpful. Doubtless he has the ideas clear in his own mind, but the reader finds himself puzzled at times to catch the meaning which the author wishes to convey to him, with the result that injustice may be done to the book. There is another not unimportant point, namely that one encounters quite a number of statements of opinion, introduced as if they were well accepted facts, and sometimes even stated to be such, tho it is probable that a large number of thoughtful and experienced readers will demur when asked to accept any deductions from such premises.

It would be quite impossible to discuss these at length or even to enumerate them with sufficient context to make the objections to them intelligible, but there is one which cannot be allowed to pass unchallenged. Colonel Herbert has long conceived the idea that when a section is made in the sclera or sclerocornea, a permanent filtering scar—as opposed to a fistulous scar—is developed as the result of the invasion of the wound by a loose "spongy scar tissue" which does not undergo cicatrization, and which does not become truly fistulous. This question was discussed at length in another journal (B. J. O., Vol. V, pp. 91, 183, and 237), and it is therefore superfluous to go into details again, but it may be observed that Colonel Herbert has never been able to answer the long standing and repeated challenge that he should produce anatomic evidence in support of the form of scar, which he has visualized, and as he states, "insisted on"—a form which, the reviewer contends, is opposed to all that we know of the behavior of new fibrous connective tissue in a wound.

The author's only contribution in the book to this subject is an illustration of a section of an eye which had had been operated on *five weeks* earlier, and which he presents as "the only satisfactory filtering cicatrix of this type that the writer has had the opportunity of examining anatomically."

Whilst freely admitting that it is unsatisfactory and difficult to form a judgment from a reproduction of a section which may do scant justice to the original, it can hardly be claimed that Figure 2 (p. 43) gives material support to the author's contention. As it stands, it looks like an ordinary healing scar. Even had it supported the author's argument much more strongly than it appears to do, there would still be two important considerations to bear in mind—(1) The period of five weeks seems far too short to maintain the author's contention that "there was little doubt, however, that filtration would have proved ample for some years, if not permanently." We are all familiar with the fact that, be our operation what it may, a scar that filters for the first few weeks may gradually but steadily close up and become quite impermeable; time is of the essence of the contract, and the reviewer cannot agree that it is wise to found so momentous a decision on a question of principle on such anatomic evidence as is here presented. (2) In no case could a single section carry conviction of the presence of a filtering, as opposed to a fistulous scar; serial sections of the whole area involved would be required to prove the absence of actual fistulization. To the reviewer's mind, Colonel Herbert has gone ahead of his facts; he appears to have visualized a condition which is unproved anatomically, and which many will believe does not exist; on the strenth of this assumption, he has launched a far reaching attack on the fistula producing operations, and has advocated in their stead two methods of operating, namely sclerotomy and iris inclusion. This is no academic question, and ophthalmic surgeons must take it very seriously, in view of the responsibilities that attach to their decision on the matter. Rightly or wrongly, the reviewer believes—and he thinks that there is a good deal of anatomic evidence behind his contention—that the hope of the future in the treatment of glaucoma is bound up with the fistula producing operations.

As has already been said, the book is largely an attack on sclerocorneal trephining. A number of the statements made under this heading are so utterly opposed to all that the reviewer has seen, not only in his own practice but in that of surgeons from every part of the world, that he feels at a loss to know where to begin in discussing them. Colonel Herbert's views (a) on the form of filtering scar commonly obtained after trephining, (b) on the anatomic characteristics of the corneal edge of such a scar, (c) on the spread of the filtering fluid thru the conjunctiva in these cases, and (d) on the relative danger of late infection, are so contrary to his own experience, that it seems hopeless even to seek a common basis in discussing them. He and Colonel Herbert are arguing from different premises. Some light may, however, be thrown on the subject by certain admissions made in the book. On page 51 we read of "the author's limited experience of trephining results"; on page 88 we learn that the opposition to sclerocorneal trephining, which runs thru the book has been written "by one who has never himself practised the method." This would appear to explain a good deal. To quote Colonel Herbert's own words, which he uses in discussing another form of operative procedure on page 110: "It is dangerous, however, to criticize without actual experience of the method." The case against trephining, as put by Colonel Herbert, is that its dangers make it unjustifiable when other safer and more reliable methods are available. Very much turns on the correctness of the premises from which Colonel Herbert thus argues. To the reviewer's mind these can be challenged at every step.

One can turn with pleasure to another of the main subjects of the book, namely that of the various operations which Colonel Herbert has from time to time brought to the notice of the profession. Those who are interested in them can find them all under one cover, and can read their author's views and comments on them; thus gaining a comprehensive survey of the whole

of his work, and easily availing themselves of the fruits of his large experience. Colonel Herbert complains that his wedge isolation operation "suffered in general estimation from the fact that the originator himself gave up the method very largely."

This was, however, only what might have been expected. Indeed, if the reviewer has rightly gauged the general feeling among ophthalmic surgeons, it is to the effect that the various methods of sclerotomy which Colonel Herbert has brought, one after the other, before the profession, have failed alike to satisfy their author and many of his followers as to their efficiency. The dream of a "spongy filtering scar" would seem to have led Colonel Herbert away from the fistulizing operations, and in so far as it has done so, to have dissipated his efforts, and robbed them of the fruition which his energy and industry have so well deserved.

One of the chief motives of the book is an advocacy and a defense of iris inclusion operations. Colonel Herbert contends that all our ideas of the danger of prolapse have been derived from cases of "unprotected prolapse"; that "the effectiveness of iris impaction has been proved in thousands of cases"; that "it is the retinal epithelium which is effective in preventing healing"; that "experience has shown iris-inclusion to be the most certain method known of keeping a sclero-corneal wound open," and so on. It is probable that quite a number of surgeons will hesitate to accept these and some of the other statements made in the same connection without a certain, and even a not inconsiderable amount of reserve.

After expanding his argument, Col. Herbert goes on to say (p. 112) that "In India, Egypt and the East generally, treatment by iris-inclusion might apparently, with advantage, become at once the routine practice for the great majority of primary glaucomas. **** Why should not this proposition apply universally, if the advantages are truly as great, and the drawbacks as certainly under control as maintained in Chapter II?"

The reply is that the "if" is a very big one. Once again let us quote from Colonel Herbert: "Deliberate iris-inclusion has never made the least headway in this country; it has hardly made a beginning. This is due to a series of misapprehensions." Is Colonel Herbert correct in this? May it not be that it is the sound, level common sense of the British surgeon that has made him hesitate to embark on a type of operation which the teaching received in his early days and the experience of his later years have alike taught him to regard with deep suspicion? It has been shown again and again that permanent and satisfactory fistulization can be obtained in wounds which are clinically iris free. There are many who doubt whether the inclusion of iris in a wound really favors successful fistulization. It will be time enough to discuss the "spongy-filtering" scar, with or without iris inclusion, when the existence of such a scar has been anatomically demonstrated and not before. The author's contention (p. 79) that "If it be true that nearly all fistulous cicatrices, clinically iris-free, are in reality iris-containing, this fact undermines all serious opposition to professed iris-incarceration as distinct from prolapse," does not seem to the reviewer to be logical.

Clinical experience has convinced a great many surgeons that the freer they can keep their operation scars of iris tissue, the safer are the eyes involved. To this end they have learned to frame their technic along lines which they believe experience has justified. The anatomic demonstration that their scars are, in their depth, not as free of iris as they hoped and thought, tho undoubtedly interesting from an academic point of view, by no means necessarily shakes the foundations of a belief, which, to their minds at least, rests on sound clinical experience.

The book is so full of statements which the reviewer cannot accept and with which he believes the majority of American and English surgeons will disagree, that he finds it impossible to deal with them in detail. The fact that

Colonel Herbert has done very valuable work in the past and that his reputation stands deservedly high among his colleagues, should not be allowed to prejudice the question he raises. The book is avowedly heterodox, and must be taken on its merits. It may be that it will prove of value by giving many "furiously to think." If it does so, it will do good, but it should not be accepted without the strictest examination, alike of its foundations, assumptions and deductions therefrom.

R. H. ELLIOT.

Ocular Semiology. (Semeiologie Oculaire, La Calotte Corneo-Sclerale, Anatomie, Physiologie-Pathologie.) **Felix Terrién,** professeur agregé a la Faculté de Médecine de Paris. 1 volume, 260 pages, 144 figures, Paris, Masson et Cie.

The anterior portion of the eyeball is of special interest to the general practitioner as well as to the ophthalmologist, on account of the availability of examination, its frequent reaction and association with both local and general disease; and of this the corneoscleral sector is the most accessible. Minute lesions such as fine efflorescences or small infiltrations in the cornea, which may be overlooked in a superficial examination, often give the key for diagnosis of latent tuberculosis or syphilis. Here the corneal microscope and slit lamp, recent contributions to ophthalmology, follow up these lesions in a remarkable manner. To these the author has given a new chapter. He explains the affections and changes in the anterior segment of the eye in a clear way, from the clinical standpoint, after a consideration of the anatomy and physiology, he traces the different processes which obtain there which have a noteworthy clinical aspect. These are variations in the depth of the anterior chamber, the infiltrations and ulcerations of the cornea with their many varieties, the cicatricial processes, deformities, degenerations, ectasias, etc., which are often associated with general and systemic diseases. The conjunctiva of the globe itself is not neglected, as it is associated with corneal lesions. The work is a profound study of the anterior ocular segment and is important for the general practitioner, who may often save an eye with good vision before the case can be gotten into the hands of the specialist. The experience of the war gave the author a very broad view, and the result of his studies are here given in a convenient and masterly manner.

H. V. W.

Neurology of the Eye. (Manuel de Neurologie Oculaire.) **F. de Lapersonne,** Professeur de Clinique Ophtalmologique and **A. Cantonnet,** Ophtalmologiste de l'Hôpital Cochin. Paper, 416 pages, 113 figures and 4 plates in colors. Masson et Cie, Paris.

The considerable advance made in neurology of the eye in the last ten years, and the demand from the younger generation of medical men for clear exposition of these problems, justifies publishing of this second edition. The authors do not alone address the ophthalmologists and the neurologists, but have so ordered their work that practitioners of medicine who are not specialists will be able to understand the affections of the nervous system relating to the eye and to general disease. They take up their subject under the following captions: The motor and sensory apparatus of the eye, the sensory, the vasomotor and adjacent structures, clinical symptoms arising from lesions. They pass then to a review of ocular diseases in relation to general diseases under the following headings: Local and regional affections, diseases of the nervous system, the digestive, respiratory, the circulatory and the blood diseases, the kidneys and the genital system, dyscrasias to autointoxication, indications, and infectious diseases.

In the second part the authors have given a new chapter to explain the relations of the eye to diseases of the great sympathetic, Parkinson's symptom, the syndromes of the hypophysis, lethargic encephalitis, familial neuroocular affections, retinitis, azotemia and the avitaminoses.

The book is beautifully printed and well illustrated. It comes unbound, as do the majority of French publications. Study of the book is recommended to practicing ophthalmologists and neurologists.

H. V. W.

Optotypes Consisting of Test Letters and Pictographs for Measuring Acuteness of Vision. John Green, M.D., L.L.D. and **A. E. Ewing,** A.M., M.D. Paper, 24 pages and 35 engraved plates.

About three-fourths of this pamphlet was written by Dr. Green and was electrotyped before his death in 1913. It includes a history of the development of test letters and a statement of the mathematic principles in accordance with which they are constructed. There is a discussion of the relative value of different forms and series of letters; and mention of the earlier, socalled, illiterate test figures.

To the above have been added by Dr. Ewing a detailed history and discussion of universal test characters, or "test-pictographs," and details of the construction of those particularly applicable as visual tests for children. There is also a brief outline of the history of the plates which constitute the bulk of this work, and description of Dr. Ewing's own broken line test.

The plates are in effect test cards presenting various arrangements of the letters and pictographs. The majority of the cards are 7 by 14 inches with tests printed on both sides. There are also some small, square cards, on which single pictographs are printed. The different cards give a wide variety of tests and methods, which are clearly explained. They are supplied either in a heavy envelope, or in a looseleaf binder, in which individual cards are easily removed or replaced. The whole set is of a size convenient to carry, for tests to be made outside the office, and the duplication of tests gives a complete set for all purposes.

E. J.

International Clinics. Volume II, Thirty-third Series, 1923. Edited by **Henry W. Cattell,** M.D. Cloth, 310 pages, 61 illustrations and 2 colored plates. Philadelphia and London, J. B. Lippincott Co.

This volume contains twenty-five papers written by twenty-six authors. The first four of these are upon insulin and the results of its use in the treatment of diabetes. These papers cover the subject in a broad and practical way. In common with all other members of the medical profession, ophthalmologists will be interested in them.

The papers upon special ophthalmic subjects are: One on "Changes in the Fundus of the Eye in Cardiovascular Disease," by William H. Wilder, of Chicago; and one on "Some Ophthalmological Aspects of Tuberculosis," by Harry Friedenwald, of Baltimore. The former is a general review of the subject, evidently designed to draw the attention of the general practitioners to such changes. The latter includes brief reports of illustrative cases of tuberculous keratitis, iritis, chorioretinitis juxtapapillaris and intraocular hemorrhage.

Other parts of the volume will be of equal interest to the ophthalmologist. There is a condensed account of "Tularemia"; A New Disease of Man, by Edward Francis of the United States Public Health Service. Vail in 1914 (Ophth. Record, v. 23, p. 487) under the name "Squirrel Plague Conjunctivitis" reported the first case of the conjunctival lesions in man. Among rodents there have been known centers of infection among the ground squirrels of California, jack rabbits in Utah, Wyoming and Colorado, and cotton tail rabbits in Indiana, Washington, D. C., North Carolina and Tennessee. Six insects are known to be carriers of the *Bacterium tularense,* of which four bite man. It is also contracted by skinning and dressing affected animals.

The late mental and nervous sequels of epidemic encephalitis are scarcely less interesting, and the Roentgen ray as a diagnostic aid will also command

attention. The ophthalmologist, to be thoroly prepared for his work, must keep in touch with the important advances in general medicine and surgery, and this publication is particularly valuable for this purpose.

E. J.

INTERNTIONAL CLINICS has now reached its thirty-third year. This number, Volume 2, contains lectures delivered by various eminent men on subjects that are of present moment. Of particular interest are those by Banting, the discoverer of insulin, and several others, who give rather exhaustive descriptions of its use in diabetes. By giving insulin, four and five hundred calories may be added to the basal metabolic diet. There is no fixed dose. It is considered best to begin with one to five units a day, increased to thirty or forty units. It is used until the system tolerates a moderate diet without excess of sugar. In diabetic coma thirty units may be given. The cost is fairly high yet—four cents per unit—about a dollar a day. Insulin must always be administered under the skin. It is of absolutely on no account given orally in the treatment of diabetes. Patients should be in hospital or infirmary, as there is danger in giving insulin without accurate blood sugar observations until the patient's tolerance has been determined.

H. V. W.

CORRESPONDENCE.

Etiology of Trachoma.

To the Editor: The recent discussion of this feature of the trachoma question in this journal, by Gifford, March 1923, and Eaton (April 1923), if in rebuttal of my evidence, Sept. 1922, shows departures from the rule for such evidence, in that the one omits two essentials of the deadly parallel, and the other takes liberties with the record.

Gifford's story of his own infection, and the discovery of the incubation period still contains no reference to the characteristic conjunctival alterations that should be manifest in a trachoma of two years duration, or the possibility of prolonging the inflammation from an ordinary infection by stimulation with copper. I have in mind a "granular conjunctivitis" of one eye, of three months duration, that had had the copper treatment by a colleague; and that was a year in disappearing, under milder medication and restricted eye work. Before the year was out the other eye became infected, "another of the same", according to the patient who was observant and intelligent above the average. But this eye got no active stimulation and made a quick recovery.

Eaton's dissertation on infection thru the intermediary host would be gratefully acknowledged but for the misquotations which change the tenor of my observations. The house fly is specifically named but once in my paper, in a rather inconsequential way; and I am not committed to the intermediary host explanation of the spread of trachoma. I simply maintain that the role of the biting flies, tabanids or others in common circulation (and I would now like to add their excreta, including eggs) should be definitely determined, pro or con; because, in spite of appearances in the Kentucky mountains, I am unable to accept the interhuman contact doctrine. And until someone else follows up the trachoma families unto the third and fourth generation, as I have, and secures different findings, I must remain a skeptic; or until Burleson's contention (this journal for Oct. 1922) is held unassailable.

In the mean time it would be interesting to know what active warfare upon the fly, and bedbug, would do for the people in the Kentucky mountains.

Be it also noted that they are an agricultural people, only not progressive like many farmers of the Mississippi valley.

H. B. YOUNG.

Burlington, Iowa.

ABSTRACTS

Ammann, E. Central Vision of the Glaucomatous and of Amblyopes. Klin. M. f. Augenh., 1921, v. 67, p. 564.

Ammann shows that the patient fixes the interrupted test rings or squares and perceives the gaps excentrically, and does not read them by rapid tracing the contours with the eyeball. We therefore do not test the central vision, but the function of juxtacentral parts of the fovea.

Ammann describes, as a valuable symptom in glaucoma, the immense difference between light and dark vision. In one-third of all his cases, Ammann obtained useful vision of the amblyopic eye, by tying up the good eye continuously for weeks.

C. Z.

Thompson, E. Capsular Cataract with Deposit of Pigment on the Capsule. British Journal of Ophth., 1922, v. 6, p. 241.

The author submits a series of seven cases accompanied with diagramatic illustrations of each. The cases were observed during the routine examination of school children. The incidence was something under 1 in 1,000. Despite this considerable frequency, very little appears on the subject in standard books on ophthalmology. This the author believes is due to the lack of the practical interest of the subject. The etiology is in a measure speculative. At first the author was inclined to consider the condition as purely developmental, but thru the presence, in two of the cases of adhesions of the iris, indistinguishable from those formed as the result of iritis, the problem becomes uncertain as to how much the condition is due to faulty development, and antenatal inflammation.

D. F. H.

Scheerer, R. X-rays in Tuberculosis of the Iris. Klin. M. f. Augenh., 1922, v. 68, p. 186.

A severe tuberculous iridocyclitis grew worse despite the most careful treatment for 3 years. The iris was swollen, irritated, and the pupillary margin covered with projecting nodules. On account of the pupillary exudation no ophthalmoscopic view. V. fingers at 25 cm. Iridectomy for secondary glaucoma. Treatment with Roentgen rays obtained vision at 3 m. It seemed that the types with formation of nodules react favorably to Roentgen rays.

C. Z.

Bailliart, P. The Retinal Circulation with Increase of Intracranial Pressure. Ann. d'Ocul., 1922, v. 159, p. 785.

Increased pressure may be accompanied by choked disc, slight changes in the blood vessels, or no ophthalmoscopic symptoms. In the first case, there is found, in the great majority of cases, an abnormal rise in retinal pressure, usually found on the diastolic phase, the systolic often being normal. The venous pressure, on the other hand, never changes, i. e. is always equal to the intraocular tension. Where the ophthalmoscope shows little or no change, there is usually a great increase in the arterial intraocular pressure as compared to the general. A lumbar puncture is followed by a rise in the pressure, falling again when the cerebrospinal pressure rises.

C. L.

Inconomopoulos, A. Operative Indications and Results of Choked Disc. Ann. d'Ocul., 1922, v. 159, pp. 790-825.

The author reviews the literature, classifying the cases into those followed for 1 month, 30 to 60 days, 3 to 6 months, 6 months to 1 year, 1 to 2 years, 2 to 6 years, 12 years. This is followed by the report of 8 cases observd by the author. This survey has led him to the following conclusions:

(1) The presence of choked disc should be considered a menace to vision.

(2) When it is not accompanied by decrease in sight, the patient should receive a vigorous specific treatment, the state of the vision being carefully watched meanwhile. If the stasis does not ameliorate within two or three weeks, a decompression should be performed, even if the sight is still normal.

(3) When the stasis is accompanied by great and rapid loss of vision, there is need for immediate surgical intervention.

(4) If an old choked disc has resulted in blindness, surgical intervention is not necessarily contraindicated.

(5) Decompression should be followed by specific treatment or lumbar puncture, according to indications.

C. L.

Cirincione. Ocular Lesions in Affections of the Sella Turcica. Ann. di Ottal. 1922, v 50. p. 75.

Since the author has been taking routine X-rays of the sella in all cases of optic atrophy, scotomata or irregularity in the fields whose causes were not apparent, he has discovered a number of cases due to pituitary enlargement in which none of the ordinary symptoms of pituitary disturbance were present, one-tenth of his cases of optic atrophy during ten years depending on sellar or parasellar changes. One fetus showed a tumor distending the sella, which had prevented the development of the chiasm, and hence the globes of both eyes were about the size of a pea. Two cases are quoted which showed optic atrophy as the only symptoms of a sellar tumor. Vision in both cases showed marked fluctuations, with improvement in one case to 5/10 from 1/100 before the final blindness occurred.

Cirincione believes that this variation, which is unusual in the ordinary forms of atrophy is characteristic; so that when the central vision or visual field show capricious changes, while the appearance of the nerve remains the same, he suspects an affection of the sella, tumor, cyst, or pituitary hypertrophy. Two cases who showed all the ocular signs of pituitary tumor were operated on, but showed only a cystic thickening of the infundibulum cerebri which pushed the chiasm down and formed a cavity in the sella. This was evidently due to a chronic inflammation of the membranes of the third ventricle, causing internal hydrocephalus, altho the patients had no headaches or other symptoms of this condition.

Since the discovery of this condition, the author in going over other case records has concluded that a number of cases were certainly of similar origin, and that the recognition of their existence is quite important from a diagnostic point of view. Three signs are mentioned which he considers very suggestive of internal hydrocephalus. First, optic neuritis with choked disc; second, depression of the anterior clinoid process; third, decrease of the size of the sphenoid cavity with a thickening of the base of the skull as shown by X-ray. The ocular changes including field changes are similar to those of pituitary tumor. He believes that no true cases of pituitary tumor are relieved surgically, but that cases so reported have really been those of internal hydrocephalus such as he describes, or else cysts or hyperplasia of the pituitary. X-ray and radium treatment have produced an illusory improvement in some cases.

Di Marzio, The Chiasmatic Syndrome in Affections of the Hypophysis. Arch. di Ott. 1922, v. 29, p. 493.

The author brings out the importance of those cases which show no general symptoms whatever attributable to pituitary disease, but in whom a careful ophthalmologic examination shows the ocular condition to depend on pressure on the chiasm by the pituitary body. The value of the X-ray is brought out, also the possibility of error where internal hydrocephalus, or cerebral tumors elsewhere, are present. In these cases, the enlargement of the sella is accompanied by other bony changes, spreading of the sutures, thinning of the cranial bones, variations in the sphenoidal angle, which point to generally increased intracranial pressure. The technic of radiography may also be responsible for errors.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, La Fayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Centra' America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph L. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville, Tenn.; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. Edward D. LeCompte, Salt Lake City.

DEATHS.

Dr. Horace Mann Starkey, Rockford, Illinois, died June 22d, aged 72.

Dr. Alexander S. Rochester, San Jose, California, aged 40, died June 20th of septicemia.

Dr. M. K. Löwegren, the first professor of ophthalmology in Sweden, died recently at the age of 87.

Dr. William R. Broughton, New York, aged 56, died June 18th, at his home in Bloomfield, New Jersey.

Dr. Henry D. W. Carvelle, Manchester, New Hampshire, died June 2d, of embolism. Dr. Carvelle was the first oculist and aurist in the state of New Hampshire.

Dr. Edward P. Pitts, Atchison, Kansas, aged 43, was instantly killed, June 14th, in an automobile accident while en route to San Francisco to attend the meeting of the American Medical Association.

PERSONALS.

Drs. Henry M. and John W. Thompson announce the opening of a second office in Los Angeles, California.

Dr. Kasper Pischel has returned to San Francisco from his European trip.

Dr. William Ford Blake is spending a month in the Hawaiian Islands.

Dr. James J. Regan, Boston, has been appointed ophthalmologist of Cambridge City Hospital to succeed Dr. Henry Hawkins, resigned.

Dr. and Mrs. Burton Chance returned at the end of July from a vacation period spent in Bermuda.

Dr. and Mrs. Luther C. Peter started for the Glacier National Park the end of July, returning home by way of the Canadian Rockies.

The degree of Doctor of Science was conferred on Dr. George E. de Schweinitz, past president of the American Medical Association, by the University of Michigan, June 18th.

Dr. Harry Vanderbilt Würdemann, Lieutenant-Colonel, Med. O. R. C., was ordered to Camp Lewis for fifteen days active service, from June 8th to June 22d.

Dr. William Zentmayer of Philadelphia read a paper before the Lackawanna Medical Society at Scranton, Pennsylvania, during the month of May, upon "Ocular Angiosclerosis."

Dr. G. I. Hogue of Milwaukee has returned from Barcelona where he attended Dr. Barraquer's clinic. While abroad he visited other eye clinics at Vienna, Berlin, Paris and London.

Dr. Velter and Dr. Villard have been appointed as professeur agregé, the former at the University of Paris, the latter at the University of Montpellier.

At a meeting of the board of trustees of the Butterworth Hospital of Grand Rapids, Mich., June 11th, Dr. John R. Rogers was appointed chief of the eye, ear, nose and throat department.

Dr. Harry Vanderbilt Würdemann, Lt.-Col., Med. O. R. C., U. S. A., was elected president of the Reserve Officers' Association of the State of Washington, at Camp Lewis, Washington, July 20th.

Dr. Casey A. Wood, who has been in Australia for the past three months, is making a tour of the Tongan, Samoan and Fiji Islands groups. The doctor and Mrs. Wood arrived in Hawaii the latter part of July, and expect to remain there until they return to California, in September.

Dr. Norma Elles Israel, wife of Dr. Sidney Israel of Houston, Texas, attended the summer course given by Professor Lagrange at the University, Bordeaux, France. Later she was joined by Dr. Sidney Israel at Vienna, where they will attend the graduate course. While in Vienna they will be the house guests of Professor Fuchs.

Dr. Luther C. Peter of Philadelphia was a guest of the Eye, Ear, Nose and Throat section of the Canadian Medical Association at its recent meeting in Montreal, and presented a paper on "The Practical Value of Modern Perimetry in Diagnosis of Disease of the Visual Pathway." The second edition of his thoroly revised work upon the "Principles and Practice of Perimetry," has just been published by Lea & Febiger.

SOCIETIES.

The North Dakota Academy of Ophthalmology and Oto-Laryngology held its annual meeting at Grand Forks, May 31, when the following officers were elected: President, Dr. Andrew Carr, Minot; vice-president, Dr

J. D. Miller, Grand Forks; secretary-treasurer, Dr. G. Golseth, Jamestown.

The twenty-first semiannual session of the Sioux Valley Eye and Ear Academy was held in Omaha, July 9th. The first day was devoted to addresses and discussions, and the second to clinics in hospitals of the city. Dr. Jesse B. Naftzger, Sioux City, Iowa, is president of the society.

The following officers were elected, June 23d, at the eleventh annual meeting of the Pacific Coast Oto-Ophthalmological Society at Los Angeles: Dr. Frederick A. Kiehle, Portland, Oregon, president; Drs. Arthur C. Jones, Boise, Idaho, and Ronald A. Green, Spokane, Washington, vice-presidents, and Dr. Clarence Benson Wood, Los Angeles, secretary-treasurer.

The registration of the Ophthalmological Section at the recent American Medical Association meeting was two hundred and eighty-five, and the papers presented were interesting, with keen discussions from some of the most prominent ophthalmologists in the country. The new officers are: Chairman, Dr. George S. Derby of Boston, vice-chairman, Dr. Walter Scott Franklin of San Francisco, and secretary, Dr. William C. Finnoff of Denver.

MISCELLANEOUS.

Under the will of Mrs. Hannah Heyman, the New York Guild for the Jewish Blind was bequeathed $25,000.

The Manhattan Eye, Ear and Throat Hospital recently received $2,546 by the will of Mary Oakley.

Two Chicago physicians were recently fined $25 each for failure to report cases of opthalmia neonatorum.

Under the will of Rudolph Keppler, the New York Eye and Ear Infirmary was left $10,000 and the New York Ophthalmic Hospital, $5,000.

M. Farigoule of Paris with a patient in a state of hypnosis thinks he is able to demonstrate that sight exists thru millions of cell like eyes in the skin.

By the will of Mrs. Clara Glazier, the New York Association for the Blind was given $500. It also received a bequest of $20,000 from Miss Emily H. Bourne to maintain the Bourne Workshop.

It is announced in the public press that a nation wide survey of eyesight conditions in American education and industry has been undertaken by the Eyesight Conservation Council of America.

From an announcement in the public press of Berlin, one is lead to believe that glasses are being taken off the children all over Germany, and that the authorities are acting in this under pressure from the oculists.

The National Committee for the Prevention of Blindness reports that two new classes for conservation of vision have been opened during the year, one in East Boston and one in Somerville, making twenty classes in the state. There are 261 children enrolled. Large type text-books have been supplied to twenty-eight children in ordinary grade schools.

The Federated American Engineers' Association has announced the personnel of a sectional committee appointed to prepare a lighting code for the nation's schools, in collaboration with similar committees representing the American Institute of Architects and the Illuminating Engineering Society. The object is to eliminate the waste represented by faulty eyesight in school children, which is estimated as existing in 10 to 30 per cent. The care of the eyes of school children is but an extension of the movement for eye conservation in industry. Louis B. Mark of the Illuminating Engineering Society and S. W. Jones of the American Institute of Architects are in active charge of committee organization.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-face type.** The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to American Journal of Ophthalmology, 217 Imperial Building, Denver, Colorado.

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